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Urge Southwest Readjustment As Rates Are Cut 10 Per Cent

By Special Correspondent
WASHINGTON, May 27

TEN per cent is to come off rail- and its products July 1 or as soon road freight rates on petroleum thereafter as the railroads of the country can make tariffs carrying lower rates operative. The Interstate Commerce Commission, in a report on the rate inquiry begun last November decided there should be a 10 per cent cut in each charge now imposed on all kinds of freight. The publication of tariffs showing such a reduction is one of the most complicated things on earth.

It is not improbable the carriers will have to ask for an extension of time for filing their tariffs, on the plea that they cannot get them ready by the time indicated.

In regard to the handicap under which the southwestern refiners are operating, the commission suggested that "the carriers should promptly revise their rates from the southwest to the eastern group in order to lessen the spread as compared with rates between in central and trunk line territories."

Traffic managers of the western refiners, seizing upon this suggestion, are planning to redouble their efforts which have been under way for months to obtain this revision downward.

10 Per Cent Off High Level

The 10 per cent is to be taken off the high level of rates prescribed Aug. 26, 1920. It is not to come off those now actually in use. Were the rates as high now as then, the reduction, in dollars, would be about $420,000,000. So many rates, however, have been cut since that high level, the loss to the carriers, calculated on the basis of the tonnage moved in 1921, will be from $215,000,000 to $240,000,000.

The commission estimated the revenue under the reduced rates, on the basis of 1921 tonnage, would be about $225,000,000 smaller.

Not all rates on crude and refined in the territory east of the Mississippi and north of the Ohio and Potomac will be cut. Each was reduced 3.5 cents per 100 pounds early in the year. Not all are as much or more than 35 cents per 100 pounds. Ten per cent of a 35 cent rate would be equal to 3.5 cents, the amount of the cut removed early in the year.

Unless extremely conservative estimates are based on false foundations, the cut ordered by the commission will mean a saving either to the oil industry on the crude and refined products of something more than $20,000,000. If three fourths of the asphaltum shipped in this country by the largest railroads is the product of petroleum refining, as was estimated by witnesses for the petroleum industry, the minimum saving to the industry or its customers, will be about $20,100,000.

It is hard to make an accurate estimate, for two reasons. The first is that no one has undertaken to make a detailed estimate as to what the average rate on petroleum shipments amounts to.

A fair guess is that the average rate on petroleum is $6 per ton. A straight 10 per cent reduction, therefore, would amount to 60 cents per ton. In 1921, 5,044,513 tons of crude "originated on class 1 roads," that is on roads having an operating income of $1,000,000 or more. In that year, 27,216,185 originated on roads of other classes making a total of

(Continued on next page)

Traffic Managers Plan Rate Attack

Staff Special

TULSA, May 27.—With the decision of the Interstate Commerce Commission published in the general rate case, traffic managers of companies in the southwest will begin an early attack on such differentials existing in the rate structure as they believe may be eliminated. A meeting of the heads of traffic departments of all principal refineries in Group 3 is planned for the near future.

For several months traffic managers have been marking time because of their uncertainty as to the action of the commission. They have not thought it wise to file any definite complaints on the theory that the decision might eliminate the necessity for the action.

Rumors here have been that the carriers may seek to invalidate the decision of the commission by taking an appeal to the Supreme Court. But even if that is done the traffic men will not delay further their plans for a seeking adjustments.

While pleased with the decision of the commission to a certain extent, the feeling here is that only a beginning in the right direction has been made. They consider it a new foot-hold from which they can push on to even better conditions.

No outline of the general course of action of the traffic representatives of oil companies can be given at this time. No copies of the full order of the commission have been received here as yet. Newspaper reports have been unsatisfactory as a basis for studying out the real results accomplished and planning a course of action. The plans will be evolved in conference to be held at a date to be fixed as early as possible in June.

Thus far general opinion here is that Group 3 will be largely benefited after July by addition of a considerable trade territory east of the state of Indiana, out of which Oklahoma was forced by the general 35 per cent increase. While the reduction has been the same in percentage, belief here is that in dollars and cents the reduction of long hauls to eastern territory will be relatively greater than the reduction on short hauls in eastern territory. For that reason the refiners particularly in this territory believe that they will be enabled to move much more material east.

33,360,698. At the saving of 60 cents per ton, the money would amount to $20,016,419. Including three fourths of the asphaltum hauled in 1921 by the originating roads, makes the total saving $20,610,419.

In the event any pipe line, as a common carrier advanced its rates under the permission granted to carriers in August, 1920, those rates will have to come down 10 per cent, deducting the cuts that may have been made since August, 1920, from the amount that 10 per cent of the rates of August, 1920 would be, so the total cut since Aug. 26, 1920, would not be more than 10 per cent.

Pipe lines were not specifically mentioned in the commission's report, either in 1920 nor the report given the public May 24, 1922. In disposing of the petroleum part of the case made in behalf of lower freight rates the commission said:

Oil Affects Cost

"Fuel oil, gasoline, and other petroleum products are important elements of cost in mining, agriculture, and industry, being used as fuel or motive power from mine machinery, irrigating plants, tractors, and trucks. Petroleum loads heavily, moves in large volume with little loss or damage, and shippers usually furnish the tank cars. They say that their compensation from the carriers for use of the cars is less than cost.

"In August, 1918, at the solicitation of the petroleum industry, the director general of railroads substituted a flat increase of 4.5 cents per 100 pounds in all carload rates on petroleum and its products for the 25 per cent increase previously applied under his General Order No. 28. This resulted in comparatively small percentage increases in long-haul rates, but the percentage increases in short-haul rates were greater than on commodities generally and in many cases ranged from 100 to 200 per cent. Shippers stated that as a result most short-haul rates upon petroleum, especially upon crude and fuel oil, are greatly out of proportion to the cost of transportation.

"Shippers urged that the great extent to which interior southwestern refineries were idle in 1921 was due to the percentage increases in rail rates on petroleum products from these refineries to northern and eastern markets, which had widened the spread in transportation charges to the disadvantage of southwestern refiners. For example, the rates from Tulsa, Okla. and Wood River, Ill., to Cleveland, O., prior to the increase of 1920 were 45 cents and 25 cents, respectively, a difference against Tulsa of 20 cents. That increase resulted in rates of 62 and 35 cents, respectively, increasing the difference to 27 cents.

"The record indicates that although more than 55 per cent of the crude petroleum produced in the United States in 1921 came from wells in the southwest, less than 20 per cent of the total crude produced was refined by the interior refineries in that region, and that, of the crude produced in the southwest, 57 per cent moved either by pipe lines to refineries elsewhere, or by pipe lines and tank vessels to Atlantic ports, thus depriving the rail lines of much revenue.

"Shippers say that such readjustments as the carriers have made since August, 1920, instead of lessening the burden placed upon the southwestern refineries by the percentage increases, have augmented that disadvantage to the extent of 3.5 cents per 100 pounds, the amount of a flat reduction in rates between points in central territory and from central to trunk-line territory. Following that reduction the advantage of Wood River over Tulsa in reaching Cleveland became 30.5 cents.

"Rail lines are not obtaining as great a proportion of the total movement as they did in former years. This is due chiefly to the rapid development and increased use of other forms of transportation, notably pipe lines, motor trucks, tank vessels, and accessorial storage facilities. While transportation by these other forms of carriage is undoubtedly in many cases more economical than by rail and while rail lines may not expect to retain the entire traffic, use of the other forms of transportation is enhanced by the existing level of rail rates.

"The increases in many short-haul rates over the 1917 basis are now from 5 to 6.5 cents per 100 pounds, which in themselves would be high rates in many cases. Many short-haul rates are materially higher than on other commodities of like transportation characteristics. The rail lines are losing some short-haul traffic which they might retain at lower but still remunerative rates. Self-interest would seem to dictate revision by them of their short-haul rates."

Shippers of petroleum throughout the country have agreed upon a plan contemplating reductions in and readjustment of practically all petroleum rates on the following basis:

1. In official classification territory. Readjusted to rates of Jan. 1, 1917, plus 40 per cent.

2. In New England. 4.5 cents per 100 pounds.

3. Between trunk-line territory and New England. 4.5 cents per 100 pounds, with 90 per cent of fifth class maximum.

4. Between central freight association territory and New England. Readjusted to basis of 2 cents per 100 pounds over the New York rates (No. 1 above).

5. Southern and western classification territories, except Pacific coast. (1) Local rates—15 per cent, plus a specific reduction of 4.5 cents per 100 pounds. (2) Proportional rates—15 per cent, plus 2 or 2.5 cents per 100 pounds, whichever was authorized in freight rate authority No. 96.

6. Pacific coast territory. 15 per cent, plus specific reduction of 4.5 cents per 100 pounds.

7. All territories. Application of any minimum rate for short hauls eliminated.

Pipe Line Tax Hearing Postponed To June 7

Staff Special

TULSA, May 27.—Hearing of arguments on the pipe line transportation tax originally set for May 31 has been postponed until June 7. The hearing will be held at Washington, D. C.

Prior to the Washington hearing, representatives of the American Petroleum Institute, Mid-Continent Oil & Gas Association and the Western Petroleum Refiners Association will meet at the institute's New York offices to outline a plan of presentation for the evidence and arguments. The New York conference has been set for June 5.

Since the national conference on transportation taxes held at Chicago April 28, efforts have been directed toward obtaining a hearing for the industry before the attorney general, secretary of the treasury and the collector of internal revenue. Hope is that the government may revise its ruling that oil transported by a refinery's own private lines to its plant is subjected to the transportation tax. Failing in this efforts will be made to have the government intervene in the test suits now in the courts.

To Build Gasoline Plant Near Tonkawa

By Special Correspondent

PONCA CITY, May 27.—Announcement of the location of a Comar-Marland gasoline plant in the Tonkawa field was made today by R. R. Owens, superintendent of the Marland Refining Co.'s gasoline department of the Roxana Petro- constructed to handle 3,000,000 feet of gas at the start and will be in operation in 120 days.

Site for the plant has been secured on the southwest corner of the northeast quarter of 10-24-1w, A. M. Alling farm, on which the Gypsy Oil Co. has an oil and gas lease. Low pressure absorption will be used in recovering the gasoline. The plant will be built to operate at 25 pounds, according to Mr. Owens.

Work on the plant is to start immediately. Gas from the producing leases in the Tonkawa field will be used at present and provisions are being made to enlarge the plant to care for additional gas as the field is extended.

Sam F. Carney, superintendent of the gasoline department of the Roxana Petroleum Corp., of which the Comar Oil Co. is a subsidiary, will co-operate with Mr. Owens and the Marland interests in the construction and operation of the plant.

Lease Warehouse Sites

ENGLAND, ARK., May 27.—Sites for the construction of warehouses and bulk storage have been leased by the England Oil Co. at Gillette and Humphrey, Ark. Work on the plants is to be begun at once according to the announcement of J. E. Hicks, president of the company.

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Tank Wagon Gasoline Prices Are Low In Comparison With Crude Cost

HOUSTON, May 25

HEREWITH are presented a number of points affecting the possibilities of price changes in the petroleum industry, from which the reader may draw his own conclusions. These points are set forth in terms calculated to indicate the trend of crude conditions as related to refined products markets, as follows:

1. The Chicago tank wagon price of gasoline at 22 cents a gallon, as represented in the May 8 advance, is 4.62 times the $2 a barrel crude oil cost at the wells in the Mid-Continent; that compares with a 20 cent gasoline tank wagon market from May 2 to June 13, 1921, when Mid-Continent crude was $1.50 a barrel, motor fuel then bringing 5.60 times the raw material cost at the wells.

2. At a time when Prairie Oil & Gas Co. is reported still to be adding 3 million barrels of crude monthly to its steel storage stocks, it will be recalled that the Sinclair Crude Oil Purchasing Co. stocked 1,851,673 barrels in April and 2,176,264 barrels in March. Prairie Oil & Gas Co. figures are not confirmable, this purchasing agency not making its stock statistics public, but the quantity of crude estimated to be going to its storage tanks monthly has been closely checked and the estimates hereinbefore given are believed to be workably correct.

3. Taking cognizance that Oklahoma-Kansas production increased 15,054 barrels daily average in April over March, to 498,393 barrels daily, and considering the Mid-Continent pools giving promise of greatly increased production over the summer drilling season, the question of oil being stored in the face of other quantities of crude in sight over the next few months brings up a query as regards the future of the

Big Stocks, Low Price

4. When a year ago crude oil stocks reached a point where in relation to consumption there was a supply on hand that would cover 120 to 125 days requirements that time corresponded with the low mark of last year's crude oil markets. U. S. Geological Survey statistics of petroleum for March, 1922, show that on April 1, with constantly increasing production of crude, 140 days supply of raw material was on hand at the then rate of consumption.

5. The foregoing points give at once a promise and a threat for the oil industry. Considering supplies of petroleum products on hand at the end of February and the end of March, (**National Petroleum News**, May 17, 1922, page 20) and herewith repeated, the opening up of refined demand is apparent:

Product	February 28 Days Supply	March 31 Days Supply
Gasoline	66.2	59.4
Kerosene	60.7	52.5
Gas and Fuel Oils	52.3	42.1
Lubricants	115.4	76.1
market.*		

*The figures of the Geological Survey for April show a total production of 488,067 barrels, an increase over March of 13,680 barrels a day.

By Paul Wagner

STAFF REPRESENTATIVE

Advancing tank wagon markets, which are reflected in refinery prices, promise the refiner relief,but this must be studied with due regard for the relation of refined products to crude costs at the wells.

Whether crude prices will remain as they are or will show changes depends upon two factors (a) demand (b) the quantities of raw material on hand, and in sight, plus the phase injected into the situation by the necessity for still further storing surplus crude; and, again, how long that situation is to be faced.

Crude and Refined Oil Costs

Proponents of advancing crude oil prices, who base their predictions upon rising tank wagon markets fail to take into account the relation between raw material and finished products in other years. Whereas the Chicago tank wagon price of gasoline, June 15 last year, was 20 cents a gallon, the price of crude oil then was $1 a barrel at the well in the Mid-Continent. With a current Chicago tank wagon price for gasoline of 22 cents the Mid-Continent crude oil market stands at $2 a barrel.

The foregoing taken into consideration, Mid-Continent crude oil prices have undergone a 100 per cent change upwards, whereas the Chicago tank wagon fluctuation as between June 15, last year, and the present time represents a gain of approximately 9.1 per cent. Approached from the viewpoint of the gasoline price in terms of its "times crude cost" at the wells, the ratio stands currently at 4.62 as compared with 8.40 as the ratio in effect June 15, 1921, when crude stood at $1 a barrel and the Chicago tank wagon gasoline market was 20 cents.

On May 2, 1921, with Mid-Continent crude bringing $1.50 at the wells and the Chicago tank wagon market 20 cents, the selling price of gasoline was 5.60 times the crude cost at the wells. On June 25, with gasoline cut to 18 cents, tank wagon, and crude standing at $1 a barrel in the Mid-Continent, the ratio was 7.56 times the cost of the raw material.

Chicago tank wagon prices for gasoline and kerosene (the figures on the latter also being shown in an accompanying table) are used for this comparison because they are considered to be most representative of the industry, similarly as Mid-Continent crude is the corresponding raw material factor.

Comparison With Other Years

In terms of gasoline selling prices times the crude cost at the wells, the following figures are submitted for corresponding periods in other years:

Period	Gasoline Price Times cost of Crude at wells	Kerosene Price Times Cost of Crude at wells
June 7, 1915.....	10	5.79
March-July, 1916	5.01	2.17
April-August, 1917	4.95	2.10
April-July, 1918...	4.21	2.15
May-July, 1919 ...	3.83	2.45
May-August, 1920	3.12	2.22
May 2-June 13, 1921	5.60	2.94
May 8, 1922	4.62	2.41

The extent to which tank wagon advances figure in the readjustment of crude prices is not to be discussed herein, especially when other factors such as transportation, distributing costs, financial investment and economic conditions may be factors affecting raw material markets in either direction. It is the thought of the writer merely that predictions of crude oil advances based upon rising tank wagon markets at the present time are not necessarily based upon a true predicate, especially when the aforementioned points are taken into account.

Increased Production Forecast

Actually, the promise of greatly increased Mid-Continent production over the summer drilling season can be said to threaten as regards upward price changes for crude. In the opinion of competent students of price conditions, whose business depends upon their doping trends correctly, the only thing that averted crude oil price reductions this spring was the dropping off of Haynesville and Mexia light oil production from 250,320 barrels daily average, March 20, to 157,000 barrels, April 10. This was followed by a further slump until the combined production of these fields now is less than 140,000 barrels daily.

In the meantime, however, the South Electra division of the Greater Wichita Falls district promises within the next 60 to 90 days to increase its daily average production, at least 10,000 to 20,000 barrels daily; the Pioneer pool of Eastland county, Texas, can easily treble its 12,000 barrels current daily production and perhaps exceed that average under intensive operations; Mexia

Automobile Output Increases In April

WASHINGTON, May 25.—Reports received by the Department of Commerce show a further increase in the production of automobiles during April. New records were made for the output of both passenger cars and trucks, compared with the preceding ten months for which figures are available.

With the reports lacking for only a few small companies, April production of passenger cars amounted to 196,512, or an increase of nearly 30 per cent over the March production of the identical firms. The April truck production totaled 21,944 machines, compared with 19,449 from the same firms in March.

The following figures give the production for identical firms for the last four months:

1922	Passenger Cars	Trucks
January	81,638	9,204
February	109,039	11,968
March	152,647	19,449
April	196,512	21,944

may be expected reasonably to hold its daily average around the present level of 85,000 barrels; the Lyons-Quinn pool of Oklahoma, although probably past its peak because of encroaching salt water, still will produce thousands of barrels; Burbank, in the Osage with only 12 million to 14 million barrels of its potential reserve taken out, can easily gain a few thousand barrels daily production each week under present methods of operation and were the conservative operating policy in effect to be abandoned for intensive drilling there is no saying to what mark it might reach.

Burbank Important Factor

Burbank's control is such, however, that the most to be feared from it is steadily mounting daily averages from week to week; although it does constitute a reserve estimated in some quarters to have a possible final recovery of 110 million barrels.

A more conservative estimate, which will be assumed to be more nearly correct, is that Burbank's possible ultimate production is 90 million barrels as compared with 70 million barrels probable ultimate production.

Production to May 1, last, is estimated at 10,600,000 barrels or slightly lower than **National Petroleum News** figures (May 10, 1922, page 59). Checking these figures against the probable ultimate, Burbank was reckoned to have a May 1 reserve of 59,400,000 barrels. Since the foregoing Burbank figures were made up extensions to the field have resulted, making for proportionate increases in its possibilities.

It has been estimated that 50 per cent of Burbank's ultimate production will have been recovered by Jan. 1, 1924, or roughly 19 months hence; therefore, if such is to prove out, Burbank's 295 wells that were making 65,750 barrels daily in the week ended May 13 must be reckoned with as a factor this summer. This is especially true when Burbank is taken into account as a stable, increasing development, with its field mark considerably in advance of it, whereas other flush areas must be taken into account as providing the "spot" possibilities of crude congestion later in the summer.

Interesting among other areas for its possibilities is the general Creek county territory, around Bristow. The "poor farm" territory, where the Roland Oil Co.'s latest big completion was rated as high as 16,000 barrels daily at the start, cannot be lost sight of as a flush production factor. Nor will the Roland completion discourage the drilling campaign elsewhere in that general area, southeast of Cushing, where geological investigations preliminary to further testing are known to be under way. Rather, it will stimulate new work, not only on offset leases, but throughout the general territory, which is not lacking in prospective producing areas heretofore untested.

Mid-Continent Crude Oil Prices With Regard to Chicago Tank Wagon Markets

Date	Product	Changes	Chicago Tank Wagon (Cts. per Gal.)	Posted Price Crude (Dols. per bbl.)	Times Crude Cost
March 1, 1915	Gasoline	.....	10½	$ .40	11.5
March 1, 1915	Oil	.....	5½	.40	5.78
June 7, 1915	Gasoline	Cut 1c	9½	.40	10.00
June 7, 1915	Oil	.....	5½	.40	5.79
Sept. 15, 1915	Gasoline	Up 1c	10½	.80	5.52
Sept. 15, 1915	Oil	Up ½c	6	.80	3.15
Sept. 29, 1915	Gasoline	Up 1c	11½	.80	6.05
Sept. 29, 1915	Oil	Up ½c	6½	.80	3.42
Oct. 25, 1915	Gasoline	Up 1c	12½	.80	6.47
Oct. 25, 1915	Oil	Up ½c	7	.80	3.68
Nov. 15, 1915	Gasoline	Up 1c	13½	1.00	5.67
Nov. 15, 1915	Oil	Up ½c	7½	1.00	2.94
Dec. 13, 1915	Gasoline	Up 1c	15½	1.10	5.85
Dec. 13, 1915	Oil	.....	7½	1.10	2.46
Dec. 30, 1915	Gasoline	Up 1c	16½	1.20	5.77
Dec. 30, 1915	Oil	.....	7½	1.20	2.62
Jan. 27, 1916	Gasoline	Up 1c	17½	1.55	4.7
Jan. 27, 1916	Oil	.....	7½	1.55	2.03
March 7, 1916	Gasoline	Up 1c	18½	1.55	5.01
March 7, 1916	Oil	.....	7½	1.55	2.03
March 18, 1916	Oil	Up ½c	8	1.55	2.17
July 20, 1916	Oil	Cut ½c	7½	1.55	2.03
Aug. 16, 1916	Gasoline	Cut 1c	17½	.95	7.74
Aug. 19, 1916	Oil	Cut ½c	7	.95	3.09
Sept. 7, 1916	Gasoline	Cut 1c	16½	.90	7.71
Sept. 7, 1916	Oil	.....	7	.90	3.27
Oct. 10, 1916	Gasoline	Cut 1c	15½	.90	7.24
Oct. 10, 1916	Oil	Cut ½c	6½	.90	3.04
Dec. 6, 1916	Gasoline	Up 1c	16½	1.00	6.93
Dec. 6, 1916	Oil	Up ½c	7	1.00	2.94
Dec. 18, 1916	Gasoline	Up 1c	17½	1.20	6.14
Jan. 2, 1917	Gasoline	Up 1c	18½	1.40	5.56
Jan. 2, 1917	Oil	Up ½c	7½	1.40	2.25
Jan. 16, 1917	Gasoline	Up ½c	19	1.70	4.7
Feb. 1, 1917	Oil	Up ½c	8	1.70	1.98
April 23, 1917	Gasoline	Up 1c	20	1.70	4.95
April 23, 1917	Oil	Up ½c	8½	1.70	2.10
Aug. 25, 1917	Gasoline	Up 1c	21	2.00	4.41
Aug. 25, 1917	Oil	Up 1c	9½	2.00	2.00
Nov. 14, 1917	Oil	Up 1c	10½	2.00	2.21
April 18, 1918	Gasoline	Up 1½c	22½	2.25	4.21
April 18, 1918	Oil	Up 1c	11½	2.25	2.15
July 30, 1918	Gasoline	Up ½c	23	2.25	4.30
July 30, 1918	Oil	Up ½c	12	2.25	2.24
Jan. 15, 1919	Gasoline	Cut 2½c	20½	2.25	3.83
May 15, 1919	Oil	Up 1c	13	2.25	2.45
July 7, 1919	Gasoline	Up 1½c	22	2.25	4.10
July 7, 1919	Oil	Up 1c	14	2.25	2.62
July 11, 1919	Gasoline	Cut 1c	21	2.25	3.92
July 11, 1919	Oil	Up ½c	14½	2.25	2.71
Dec. 23, 1919	Oil	Up 1c	15½	2.75	2.37
Dec. 23, 1919	Gasoline	.....	21	2.75	3.21
Jan. 15, 1920	Gasoline	Up 1c	22	3.00	3.08
Jan. 16, 1920	Oil	Up 1c	16½	3.00	2.31
Feb. 2, 1920	Gasoline	Up 1c	23	3.00	3.21
Mar. 3, 1920	Gasoline	Up 1c	24	3.50	2.88
Mar. 3, 1920	Oil	Up 1c	17½	3.50	2.10
Mar. 17, 1920	Gasoline	Up 1c	25	3.50	3.00
May 25, 1920	Gasoline	Up 1c	26	3.50	3.12
May 25, 1920	Oil	Up 1c	18½	3.50	2.22
Aug. 26, 1920	Gasoline	Up 1c	27	3.50	3.24
Aug. 26, 1920	Oil	Up 1c	19½	3.50	2.34
Sept. 15, 1920	Oil	Cut 1c	18½	3.50	2.22
Jan. 25, 1921	Gasoline	Cut 2c	25	3.00	3.44
Jan. 25, 1921	Oil	Cut 3c	15½	3.00	2.17
Feb. 2, 1921	Gasoline	Cut 2c	23	2.50	3.86
Feb. 2, 1921	Oil	Cut 2c	13½	2.50	2.27
Mar. 14, 1921	Gasoline	.....	23	1.75	5.52
Mar. 14, 1921	Oil	.....	13½	1.75	3.23
April 25, 1921	Gasoline	Cut 3c	20	1.75	4.80
April 25, 1921	Oil	Cut 3c	10½	1.75	2.52
May 2, 1921	Gasoline	.....	20	1.50	5.60
May 2, 1921	Oil	.....	10½	1.50	2.94
June 13, 1921	Gasoline	.....	20	1.25	6.72
June 13, 1921	Oil	.....	10½	1.25	3.52
June 15, 1921	Gasoline	.....	20	1.00	8.40
June 15, 1921	Oil	.....	10½	1.00	4.41
June 25, 1921	Gasoline	Cut 2c	18	1.00	7.56
June 25, 1921	Oil	Cut 2c	8½	1.00	3.57
Aug. 23, 1921	Gasoline	Cut 1c	17	1.00	7.14
Sept. 30, 1921	Gasoline	.....	17	1.25	5.71
Sept. 30, 1921	Oil	.....	8½	1.25	2.85
Oct. 3, 1921	Gasoline	.....	17	1.50	4.76
Oct. 3, 1921	Oil	.....	8½	1.50	2.38
Oct. 14, 1921	Gasoline	Up 1c	18	1.50	5.04
Oct. 14, 1921	Oil	Up 1c	9½	1.50	2.66
Oct. 24, 1921	Oil	Up 1c	10½	1.50	2.94
Nov. 7, 1921	Gasoline	.....	18	2.00	3.78
Nov. 7, 1921	Oil	.....	10½	2.00	2.20
Nov. 9, 1921	Gasoline	Up 1½c	19½	2.00	4.09
Nov. 9, 1921	Oil	Up 1c	11½	2.00	2.41
April 10, 1922	Gasoline	Up 1½	21	2.00	4.41
May 8, 1921	Gasoline	Up 1c	22	2.00	4.62

Tank Car Meeting Is Called At Cleveland

Staff Special

TULSA, May 27.—Rates on excess empty mileage of tank cars will be discussed at a conference of the car service sub-committee of the American Petroleum Institute to be held at Cleveland, O., on June 6, according to word received here by members of the committee.

W. R. Boyd, Jr., chairman of the subcommittee, has invited a committee of the American Railway Association to be present at the conference.

Proper methods of rendering bills for excess mileage will be one subject to be discussed by the conference in conjunction with proposed revisions of Circular D 276. Adjustment of empty mileage credits and a method of arriving at an adjustment of errors by the carriers will be taken up.

The conference is to be held at the Cleveland Hotel.

Oil Industry Takes Into Own Hands Fire Prevention Work

Staff Special

NEW YORK, May 25

MACHINERY was set in motion at the conference May 23 on safety and fire prevention provisions as affecting the oil industry by which within a month the industry will have its own organization to carry on this work and take it in large measure out of the hands of outside organizations which have heretofore been drawing up regulations it has followed.

A general committee of 25 oil men is to be elected, five from each of the five geographical divisions of the oil industry, by directors of the American Petroleum Institute for these divisions. The divisions include the eastern, central west and Rocky Mountain, Mid-Continent, Gulf coast and Pacific coast districts.

The chairman for each committee of five is to be a practical oil man, the other four preferably with some oil engineering experience. The personnel of the committee of 25 is to be made up by June 15 and is to start functioning at once under the direction of the general chairman, Dr. Van H. Manning, director of research of the institute.

This committee in general will try to function as the channel through which will pass all work pertaining to fire protection, fire prevention and safety measures in general as affecting in any way the manufacture and handling of petroleum products.

Importance is Recognized

This work is recognized by oil men who have thought along these lines as of the greatest importance. It might be thought by the casual reader that at the best an intangible program is ahead of this committee. The two-day conference on the general subject of fire prevention and safety measures, held in New York May 22 and 23, under the auspices of the institute, developed many practical subjects of immediate importance to the industry upon which the committee can immediately throw its efforts.

The fact that the conference was participated in by over 60 oil men, engineers, government representatives, and representatives of insurance interests and others, and the additional fact that there was unanimous approval of the plan of organization within the industry, gives considerable weight to the work undertaken.

About all that has been done for the oil industry collectively to date along the line of fire prevention work has been the regulations for the construction of bulk storage plants drawn up some years ago by the Committee on Inflammable Liquids of the National Fire Protection Association, its membership including representatives of the oil business.

That committee is still active and will retain its activity. It will still consider fire prevention measures for the oil business. It was suggested at this conference that a separate committee be appointed to take consideration of petroleum products out of the general subject of inflammable liquids and make it easier for the oil industry to co-operate with the National Fire Protection Association where its own business and its own products are concerned.

Oil Business to Make Rules

The ideal in the minds of Dr. Manning and the men who have worked for an organization within the industry to carry on this work is that the oil business shall itself work out its problems along this line, on the basis of its experience and the scientific data in its possession and thus make it unnecessary for other organizations, governmental bodies and other interests to do more than approve or adopt what the oil business itself says represents the best practice along fire prevention and safety lines.

Some idea as to what work the institute committee of 25 may take up is to be gained from the report of the committee on organization which developed at the conference the plan which was adopted. The work was divided along the following lines; that pertaining to fire prevention and safety work in the producing field; for pipe lines and crude in storage; refineries and manufacturing plants; marketing stations and loading and unloading terminals; marine transportation; containers such as packages, trucks and so on; fuel oil, both for commercial and domestic use; oil inspection—to see whether or not it should be considered from a standpoint of alleged fire hazard only.

Railroad transportation of oil is omitted from this tentative program. This is because the industry, through the transportation committee of the institute, has a good working organization which has already done considerable work on this in conjunction with the railroad interests.

One immediate subject which the committee will likely be called on to take up is the storage and use of fuel oil, both in homes and factories. The great increase in the use of this product the past two years has led to a considerable discussion of this subject from many sources.

Flash Point Important

This discussion largely centers around what flash point shall be allowed for fuel oil for use in homes and in factories. Dr. Manning read at the conference a paper he had prepared on flash point as affecting the use of fuel oil, showing the difference in practice in various parts of the country and giving some idea of the thoroughness with which the industry must direct its effort to rule fairly and wisely on this subject.

(Dr. Manning's paper is published in full in this issue.—Editor).

General discussion at the conference brought out that a consideration of flash point is of the utmost importance in establishing the relative explosion hazards of petroleum products, particularly as regards questions relating to storage and use. It was suggested that the matter of flash point and its relation to hazard be the basis for the general consideration of fire prevention methods for the entire handling of petroleum products from the well to the consumer.

Aside from the discussion and adoption of the organization plan by which the industry will tackle the general problem, the session of the conference the second day was given over to open discussion, by any parties interested, of any phase of this problem of fire prevention and safety work they wished to bring before the meeting.

The subject of material and construction of tanks was brought up. Dr. Manning stated that this subject had already been taken up by the Committee on Inflammable Liquids and the oil interests and certain concrete suggestions were outlined which could be taken up by the oil industry's new organization in the near future.

Questionnaire Suggested

Houston Dunn, secretary of the National Petroleum Fire Insurance Co., Philadelphia, suggested the new committee send out a questionnaire to the oil companies asking for information designed to bring out existing fire hazards which could be easily and quickly remedied, both for the purpose of collecting data as to the causes of fires and to bring to the attention of the oil companies themselves the existence of such hazards. He stated his company, a mutual organization of oil companies, was following this plan with success.

The attention of the oil industry was also brought to the work of the National Fire Protection Association to find a method for freeing oil tanks from vapors before repair work was started, which could be made in the form of a regulation.

W. A. Jacobs, chemical engineer with the Bureau of Mines at the Pittsburgh station, discussed briefly the work he is now conducting in the study and analysis of gases given off from high sulphur content crude, chiefly Mexican crude, to determine their toxic effect. The expense of this is being borne half by the bureau and half by the oil companies interested.

Another representative of the Bureau of Mines took up the first aid work the bureau is now conducting among refineries. This consists in sending a first aid car direct to the refinery, where an actual training course in bandaging, treatments of burns, electrical shock and so on is given. This was also taken up by E. C. Esterly, assistant to the general manager, Atlantic Refining Co., Philadelphia, which company started this work two years ago. He enthusiastically endorsed the work the bureau is doing along this line.

G. W. Hooker, with the New York office of the Vacuum Oil Co., told of the general fire prevention work carried on by this company, certain features including the general grounding

of all tankage and pipe lines, and the use of liquid seals on vent lines of tanks.

Roy S. Bonsib, chief safety inspector with the Standard Oil Co. of New Jersey, at New York, told of the fire prevention and safety work this company is doing, which is now being extended to marketing plants, as well as refineries. He said his company looks upon this as a production rather than a welfare proposition.

The organization committee which drew up the plan of organization under which the oil industry will tackle this job of fire prevention and safety work, consisted of L. V. Nicholas, president of the National Petroleum Marketers Association, Chicago; J. C. Fitzsimmons, general sales manager, Standard Oil Co. of California, San Francisco; R. H. McElroy, traffic manager, Standard Oil Co. of Indiana, Chicago; W. C. Platt, president **National Petroleum News,** Cleveland; Stewart P. Coleman, research department, Humble Oil & Refining Co., Houston, and F. B. Capen, mechanical engineer, The Texas Co., Port Arthur, Texas.

High Flash Point For Fuel Oil Is Handicap For Many Crudes

By Dr. Van H. Manning

FLASH point is of importance in establishing the relative explosion hazards of volatile inflammable products. It is of particular interest to the oil industry as limiting the amount of storage and restricting the use of petroleum products. The subject of flash point vitally affects the use of fuel oil.

There are existing or proposed limitations on the storage of fuel oil having flash points below 150 degrees. It has been brought to the attention of the American Petroleum Institute that such limitations if rigidly enforced would seriously handicap the use of a large percentage of California and Mexican crude oils which in the past, due to their small light oil content, have been used, untopped, for fuel purposes. It is of interest to note too—judging from many replies gathered in the past two years—that the 150 degrees F. limitation, if rigidly enforced, would seriously affect the fuel oil output of many refineries in the Mid-Continent and Eastern districts.

On the Pacific Coast some 30,000,000 barrels of fuel oil are consumed annually, most of it having a flash point below 150 dgerees F. (closed cup) and some of it having a flash point even as low as 90 degrees. The greatest part of this crude oil has a flash point ranging from 110 to 130 degrees F. particularly the fuel used by the railroads, most of which has the lower value of 110 degrees F. (open cup). I am quoting from a reply of the chief chemist of the Atchison, Topeka and Santa Fe railway, "You will note we only require a minimum flashing point of 110 degrees F. when using the open cup. The closed cup gives with oil of this grade some 20 degrees lower flash point than the open cup so that the discrepancy between the (N. F. P. A.) requirements and ours is about 60 degrees."

Oil Used in Los Angeles

I am reliably informed that in Los Angeles more than 95 per cent of the apartment houses, office buildings, bakeries and similar establishments have been using a fuel oil (a so-called stove or furnace distillate) having a flash point between 100 and 120 degrees. In that one city alone more than 160,000 barrels of this fuel alone were used in 1919. Local ordinances permit a fuel oil flash point of 110 degrees closed cup in both Oakland and Los Angeles and of 90 degrees in San Francisco.

The fire marshal of San Francisco reports: "There has been no fire of any consequence from crude oil as installed here. At the time of the earthquake and conflagration here in 1908, there were 118 oil installations in the burnt districts; there were no explosions and when the ruins cooled off every one was found intact."

It has been stated that during the past 30 years, the fire loss in California, attributable to the use of fuel oils, would not exceed $50,000.

One third of the fuel oil used in California is crude oil. This oil as to gasoline content is comparable to Panuco crude containing a maximum of 3 per cent gasoline and as low as 1½ per cent. Refinery residium contains a maximum of ½ of 1 per cent of gasoline down to a minimum of none. It has been stated that to top this crude oil, in order to bring the flash point up to 150 degrees, would require an outlay of some $20,000,000 and would add $1,800,000 annually to the cost of fuel on the Pacific Coast.

Relative Make-up of Crudes

Until economic conditions and developments in the art of refining make desirable and possible changes in the utilization of the present crude oils, there will remain true the relation that whereas only 20 to 50 per cent of the bulk of Eastern, Mid-Continent, Rocky Mountain and Gulf Coast crudes represents the heavier fuel oil and gas oil components, in California the fuel oil and gas oil fractions represent about 67 per cent of the crude. Furthermore, during 1921 the California output of fuel oil constituted fully 26 per cent of that of the entire country.

I have been trying to establish the origin of the fuel oil flash point limitation set at 150. It is possible that when the fire regulations were first adopted the agencies responsible for these regulations used the flash points established by the U. S. Navy and of Lloyds, both of whose standards are based upon very severe and highly special conditions encountered only at sea.

In the course of my investigation I consulted Dr. C. F. Chandler, who as early as 1867-1868 established a safe flash point limit for kerosene in the metropolitan district of New York and whose classic flash point investigations extending even into European countries, were the basis of establishing the first laws and ordinances regulating the sale of kerosene. Dr. Chandler was unable to state why the flash point limitation of fuel oil was set at 150.

Admiral Robison, of the U. S. Navy, stated that naval vessels must be in readiness to proceed to the tropics at all times; that the firing of guns subjected such types of vessels to dangerous conditions to which other types of vessels are not exposed; that on account of the numerous transverse bulkheads and a protective deck, and the crowding of machinery and boilers, it is rather difficult to ventilate certain compartments; that in fact each naval vessel is a floating arsenal; all of which created the necessity of taking extra precautions to prevent fires or explosions of any description and therefore the navy considered it inadvisable to lower their flash point requirements below 150. This is the nearest I have been able to come to a scientific reason for a flash point limitation of 150 and of course you recognize the very special conditions underlying the above reasoning as affecting the use of fuel oil at sea.

I also took up the matter with Mr. Butler, of Lloyds' Register, who was kind enough to send me copies of the only material available to him, namely, a report by Prof. Brame, president of the Institution of Petroleum Technologists of Great Britain.

Prof. Brame stated that on account of the difficulties involved in making determinations of fuel oil flash points on shipboard and the needs of extreme caution applying to a marine hazard, "the chief engineer should be called upon to ascertain that the oil does not flash below 150."

I communicated with Dr. John A. Harker, of the Ministry of Munitions, London, England, who has directed divers researches at the National Physical Laboratory in conjunction with W. F. Higgins, on flash point determinations. Dr. Harker spent considerable time in searching the likely sources for a history of fuel oil flash point regulations and he is "surprised to find how little information is given in the literature."

Need of Investigation

I have requested information on this subject from Dr. S. W. Stratton, director of the U. S. Bureau of Standards, who replied on March 11, 1922, as follows:

"There appears to be need of an investigation relative to fire hazard of fuel oil as due to flash point."

He also was unable to give me any suggestions as to how the limitation for fuel oil was established at 150.

I directed my inquiry to the U. S. Bureau of Mines and received a reply to the effect that this bureau is not in possession of information that would enable it to suggest a minimum flash point that would embody all of the fuel oils of the United States.

Inquiry was made of Prof. R. E. Wilson, director of the Research Laboratory of Applied Chemistry, Massachusetts Institute of Technology. He stated he could see only three possible bases for a flash point specification on fuel oil, as follows:

1—Keeping the specifications high in order to prevent waste of gasoline by leaving it in the fuel oil.

2—A specification required in order

to make the stuff behave properly in ordinary oil-burning equipment.

3—A specification to insure the absence of danger from explosions in storage tanks.

He further stated that outside of the first two bases the flash point "temperature" should be fixed to bear a reasonable relation to the maximum temperature which the oil would be subjected to during the storage. On ships, with their cramped quarters and poor ventilation, it is conceivable that temperatures around the oil storage tanks might rise so high as to necessitate a specification of 150 F. * * * but I cannot conceive of any likely condition of fuel oil storage for industrial use where temperatures would rise appreciably above 100 F. It would, therefore, appear to me that a closed cup flash point specification of 115 F. would afford an entirely reasonable factor of safety against all ordinary uses."

I also directed my inquiry to the Underwriters' Laboratories and received their reply, to the effect that they have practically no data covering the flashing points of fuel oils.

I am greatly encouraged in the belief that the flash point limitation, as applying particularly to fuel oil, is about to receive the thorough consideration which the importance of the subject merits and that before long a flash point standard will be established which will not be discriminating and unreasonable for the oil industry and which will at the same time maintain the protection of property and life against any undue hazards in this connection.

It is of interest to note that the subject of flash point is receiving an increasing amount of attention and a close scientific connection has been established rather recently between the volatility of various materials and their flash point temperatures. I am referring now to a paper entitled "An Investigation into the Physico-Chemical Significance of Flash Point Temperatures" appearing in the April, 1922, Journal of the Institution of Petroleum Technologists, London, England. An earlier paper by W. Paymann, appearing in the Nov. 15, 1918, issue of the Journal of the Society of Chemical Industry, and entitled "The Danger of Explosion with Inflammable Liquids and Vapors" also touched upon this relation.

Flash point in the past has been regarded more as an empirical figure rather than a true physical constant, largely because the greater part of the work done in the past has centered around the flash point of a complex mixture such as kerosene. Largely because of this empiricism the research in this field seems to have been neglected until recently.

It would appear obvious that a knowledge of the flash point temperature and of the vapor pressure would give an indication of the composition of the vapor at the limits of flame propagation both for the upper and for the lower explosive limits.

It would seem that deductions made from reliable data would have practicable application to the automotive industry particularly as regards carburetor action and in internal combustion engines and I am confident that a great impetus is now being given to the study of this important relation.

Massachusetts Plans Burdensome "Gas" Tax

BOSTON, May 29.—A bill which not only imposes an excise tax of 1 cent a gallon on gasoline but will cause a great increase in the amount of bookkeeping a distributor of motor fuel must do, has been introduced into the Massachusetts legislature. The bill defines a distributor as any person, wherever resident or located, who imports fuel into Massachusetts for sale, or causes it to be so imported, and any person who produces, refines, manufactures or compounds fuel within the commonwealth. Fuel shall include gasoline, benzol and any other product, except kerosene, suitable for propelling motor boats, tractors or other motor vehicles by internal combustion or otherwise.

A distributor, under this bill, must pay for motor fuel he uses in his own vehicle and must keep a record of all sales of fuel made by him within the commonwealth, including the name and address of purchaser, place and date of delivery and number of gallons. He also must deliver to the purchaser his own name and address and the number of his license which he must obtain from the commissioner of corporations and taxation. The distributor must collect the tax from the purchaser and pay it to the commissioner for which the distributor is paid a collection fee of 1 per cent.

Motor fuel sold to the United States or that which is exempted from taxation under the constitution and laws of the United States, is free from the tax. Fuel on a prior sale of which the tax has been paid also is exempt. When a purchaser claims exemption, he must make an affidavit stating the use for which the fuel is produced, unless it is claimed to be exempt under the federal laws and constitution, and the distributor must send to the commissioner a certificate on oath of such sale and the purchaser's affidavit.

The tax is payable not later than the 15th of the month following the month in which the sale is made under penalty of loss of the 1 per cent compensation and $5 a day for each day the distributor fails to make the return.

A distributor who makes a fraudulent return, is subject to a fine of from $50 to $5,000 and one that collects more than the 1 cent is liable to a fine of not more than $5,000. One who makes a sale of fuel without having obtained a state license, shall be liable to a fine of from $100 to $10,000 and imprisonment of not more than one year, or both. In the case of corporations, the fine may be imposed against the corporation and the imprisonment against the officers. A fine of $100 to $10,000 and a year's imprisonment may also be imposed against a distributor that makes a false affidavit claiming exemption. A purchaser that makes an erroneous affidavit is liable to a fine of $5,000.

The commissioner is empowered to revoke any distributor's license. An appeal is provided. After the expenses of collection are paid, the revenue will be divided proportionately between the division of rivers and harbors and division of highways for improvement purposes.

Refining and marketing companies that sell direct to the consumer, would find themselves burdened with accounting to meet the requirement of registration of each sale, unless special sales companies should be formed. Those that sell to jobbers in large quantities would be less burdened as accounts would be larger and fewer.

Gustafson Hopeful On Trade Outlook

CHICAGO, May 27.—Returning this week from a trip through the Mid-Continent and southwestern oil fields, President C. A. Gustafson of Gustafson & Spencer, Inc., expressed himself hopefully in regard to future business for the industry in general and G & S in particular with the apparent revival of industry over the country.

In view of changes that have taken place in the last three months in some of the G & S offices, Mr. Gustafson has issued a statement covering the line-up of official personnel at the beginning of the business season.

"In the southwest my attention was drawn to an erroneous idea in the minds of some of the friends of the company, that some very important changes had taken place in the organization," he said. "This is apparently a result of the company's reducing its forces some in the interest of economy. These changes have not been made in the producing end of the business, and in no way affect its scope of operation, nor hamper its service to the oil industry."

In the home office here in Chicago, C. A. Bingham is vice president and treasurer, and H. Jensen is secretary. They, with Mr. Gustafson, constitute the board of directors. R. D. Haynes is in charge of fuel oil sales; H. M. Johnson, light oils, and J. F. Baldwin, lubricating oils, with Mr. Jensen having general supervision of sales and purchases. Heads of the various branch offices follow:

New York, J. L. Ashby; Cleveland, J. E. Hansen; Minneapolis, G. N. Olson; San Francisco, B. T. Sweeney; Kansas City, R. D. Rankin; Tulsa, R. H. Winget; Fort Worth, C. M. Ricketts; and Shreveport, H. Cannon.

Due to the unstable nature of the oil business these men have moved from one point to another occasionally and offices have been reduced as the need of the territory became less, but in three or four of the branch offices the men who opened them are still in charge.

Sun Loses Tank Of Oil

FINDLAY, May 29. — Lightning struck and fired a 35,000-barrel oil tank belonging to the Sun Co. near Rudolph, Wood county, Ohio last Friday afternoon during a severe storm. The tank contained between 15,000 and 20,000 barrels of crude oil when struck. Both the tank and oil are a total loss. The flames threatened to fire an adjoining tank, but a shift in the wind saved it.

OIL FIELD EQUIPMENT—NOTES OF TRADE

Replacement Orders Swell Supply Business In Mid-Continent Market

Staff Special
TULSA, May 27

THE PAST week has seen no changes in the quoted prices of oil well supplies, nor of line pipe and casing, and the situation remains just about as it has been for some time past. Business is fair to good with the supply companies, some of them stating that they have noticed a considerable increase in their orders of late, and all are optimistic as to the future, believing that the oil business is getting on a sound and stable foundation, and that it will remain so. Small orders continue to be the rule, but in increasing numbers as stocks diminish and replacements become necessary in field operations.

The meeting of manufacturers of rig irons which had been set for May 24 at St. Louis and was postponed to May 27, has again been deferred, this time until June 3, according to advices received here. The reason for the postponements is said to have been for the purpose of getting California representatives to the meeting.

It was called for the purpose of discussing, and passing upon, the specifications for standard rig irons as adopted by the Purchasing Agents' association last fall. Heads of supply companies here are of the opinion that the matter will have to be discussed and gone into exhaustively before anything definite is accomplished, as they see many difficulties in the way of complete standardization.

There are about 11 rig-iron manufacturers in the country, and another angle to the coming meeting is seen by some in the probability that these manufacturers will form some sort of an organization when they get together. Possibly this plan is equally responsible with the standardization movement for the calling of the meeting.

Companies manufacturing rig-irons include the following: Oil Well Supply Co., Parkersburg Rig & Reel Co., National Supply Co., Bradford Rig & Reel Co., in connection with the United Iron Works; Marion Foundry & Machine Co.; Union Tool Co., (California); Mosher Manufacturing Co., Dallas; Western Foundry & Machine Co.; Oklahoma Iron Works, and San Antonio Machine & Tool Co. How many of these have signified their intention of sending representatives to the meeting cannot be ascertained.

No further indications of impending increases in the prices of oil field tubular goods have come to light during the past week, the situation with regard to this class of material remaining about as it has been for some time past. Opinion now appears to be gaining ground that no increase in the price will be forthcoming, and evidently very little preparation for such an eventuality is being made by purchasers.

Line pipe also remains in statu quo insofar as price changes are concerned, with strict adherence to the list price the featuring the market. Quotations are still subject to wired instructions from the mills.

The line pipe market is described as active, with inquiries numerous, some of them requiring large tonnages. Deliveries of all sorts of tubular goods are from four to six weeks behind, with mill operation reported as about 80 per cent of capacity. The coal strike apparently is having but little effect upon the pipe market, although it is probably responsible for most of the feeling that has existed lately that increased prices on pipe were imminent.

Weather conditions in the field remain unsettled, this having been one of the wettest springs on record in the Mid-Continent and oil field roads are for the most part in bad shape.

Supply Trade Personals

HOUSTON, May 25.—A. J. Brainard, district manager for the Frick-Reid Supply Co., spent a part of last week in Laredo and Mirando City.

* * *

HOUSTON, May 25.—H. J. Richards, local manager for the Frick-Reid Supply Co., left on May 23 for his vacation. Mr. Richards will spend a few days at Medina Lake, out from San Antonio, then will go to Tulsa to spend the remainder of his vacation.

* * *

HOUSTON, May 25.—P. N. Boggs, vice president and general manager of the National Supply Companies, accompanied by E. W. Goeser, passed through Houston on his way to other points where National stores are located. While in Houston they visited J. F. Tucker, district manager.

* * *

TAMPICO, May 25.—Joseph Murphy, district manager of the Firestone Tire Co., was in Tampico from Houston last week, visiting E. B. Crook of the Tampico Auto Salaes Co.

* * *

TAMPICO, May 25.—Thomas J. Rauch of the National Supply Co., has returned to Tampico after a vacation spent in California. Mrs. Carlton Clymer, wife of the manager of the National in Tampico was called to Casper, Wyo., about 10 days ago by the death of her mother.

* * *

TAMPICO, May 25.—J. C. Evans, former owner of the Tampico Iron Works, of which the Tampico Marine Iron Works is the successor, has started up the plant again on his own account. It had been shut down for some time. Carlton Wagner, nephew of Charles M. Schwab, who has been inspecting the plant, will make a report to New York City with regard to the advisability of the Bethlehem Steel Corp. taking it over.

* * *

TAMPICO, May 26.—S. L. Carrico and C. R. Titus of the United Staset Rubber Export Co., Ltd., at Mexico City, are airplane enthusiasts. They flew to Tampico last week in three hours and two minutes.

* * *

HOUSTON, May 25.—H. T. Rieley, representative of the Swartwout products division of the Ohio Body & Blower Co., Cleveland, was a Houston visitor a part of the current week. He is making the rounds of southwestern territory.

* * *

HOUSTON, May 26.—The Arab Gasoline Co., incorporated in Delaware for $250,000 in March, is building a plant at Eastland, Texas, for the extraction of gasoline from natural gas. President Sharples of the Sharples Specialty Co., manufacturers of centrifugal machinery, 23rd and Westmoreland streets, Philadelphia is one of the incorporators. Walter E. Cox, also an officer of the Sharples Co., is secretary-treasurer of the Arab company.

Supply Demand Off In Texas Districts

Staff Special

HOUSTON, May 27.—A marked slump in the movement of oil field supplies was noted over the week, excepting rigs, tubing and drill pipe. These sales were in most cases to "wildcatters" or to interests operating in localized territory. Sales on other supplies are reported few.

Supply men are of the opinion that a retrenchment policy on the part of important producing companies is in the offing. It is known that at least one of the major companies already is following a policy of making no new locations except where necessary to fulfill lease requirements and still others are holding their operations to as conservative measures as possible on the theory that the increasing production in light oil territory generally threatens summer complications in the crude market situation.

Mechanical rubber goods, pumps, fittings and other supplies in common use took a sharp decline in sales over the week and prices are described as unsteady. Competition is becoming so keen that price cutting is reported frequent. This condition is especially true of line pipe, on which only small sales are reported. Short feed lines from wells to tanks have continued about the only demand in the Houston market and only a few such sales are reported.

Purchase Tulsa Plant To Turn Out Meters

TULSA, May 24.—The Mason Manufacturing Co. of Tulsa, manufacturers of the Mason Measure Meter, have purchased and now occupy a two-story brick building at the corner of Fifteenth street and Detroit avenue, in this city, and have installed a shop for the manufacture of the measure meter and other oil well specialties. The building is roughly triangular in shape, one side being parallel to the tracks of the Midland Valley R. R., and its dimensions are approximately 84 by 46 by 15 feet. The second floor contains apartments, which will be occupied by employees of the company.

The aluminum castings for the frame of the measure meter will be made in Kansas City, and the chilled-steel recording disks will be made in Coffeyville, Kan. All other parts will be made in Tulsa, and the machines will be assembled in the Tulsa plant. The capacity of the plant for the present will be five meters per day, complete. Service and repairs on meters sent in from the field will also be handled from the Tulsa plant, as these machines are sold under a guarantee of freedom from defects.

Over 800 meters have been sold to date, and are in use by many of the largest oil companies in Oklahoma, Kansas, Texas and California.

Among other oil well specialties which will be manufactured by the company at the Tulsa plant are the Mason wire line shock absorber and the Mason temper screw lift, on both of which patents have been applied for.

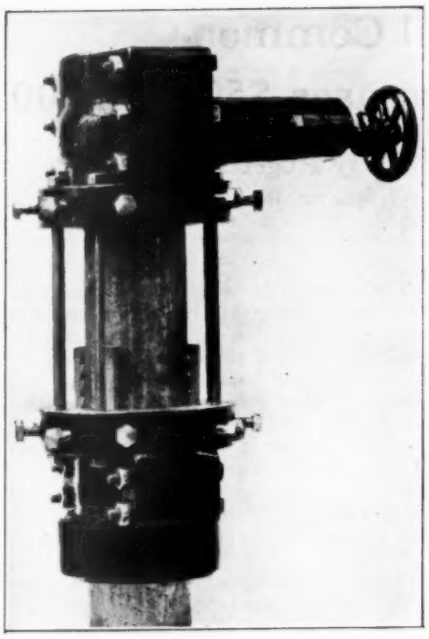
Officers of the company are: R. C. Mason, president; J. W. Minnis, vice president; John D. Freeman, secretary-treasurer, all of Tulsa.

Oil Well Conferencc Held

TULSA, May 27.—The regular bimonthly district sales conference of the Oil Well Supply Co. was held in Tulsa on Friday, Saturday and Monday, May 19, 20 and 22. These conferences, which are held every sixty days, and at which members of the sales force of the company get together to talk over their problems, were recently inaugurated, the first meeting having been held in Shreveport two months ago. The next meeting will be held in Fort Worth. Following the business sessions, those present at the Tulsa meeting enjoyed a dinner at the Hotel Tulsa.

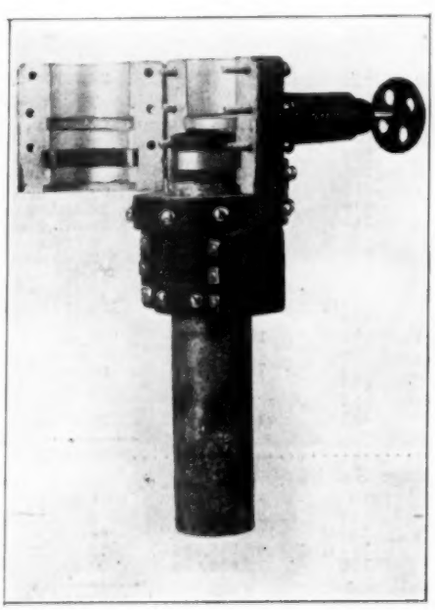
Those attending this meeting were: Grant Hubley, vice president, and W. B. Glover, sales manager, both of Pittsburgh; J. M. Post, manager southern district, Shreveport; H. J. Morlang, manager North Texas district, Fort Worth; L. A. Eberhart, sales manager, Fort Worth; J. D. Lemex, manager Mid-Continent district; Tulsa; Byron Post, sales manager, Tulsa; W. H. Thompson, Fort Worth, and C. C. Hurlburt, Tulsa.

WILKES-BARRE, PA., May 25.—Robert P. Brodhead, 62 years old, for many years connected with Paine & Co., of Wilkes-Barre, died May 18 at Kingston, Pa.



Says New Device Will Shut In Burning Well

PINE BLUFF, ARK., May 26.—A device for capping oil wells has been invented by E. H. Duckett of Pine Bluff. It consists of a valve casing formed in sections adapted to be clamped around the casinghead. The valve stem and housing extend out to one side of the casing and mounted in it is a horizontal slidable gate valve which is driven forward by a co-operating screw which has a swiveled connection with the outer edge portion of the valve. This screw has an operating handle and hand wheel by which it is rotated to drive the valve forward with sufficient power to force it straight over across the pipe and cut off the escape of oil or gas. A clamping device with radiating screws which are screwed on to the pipe below the cap forms a means of anchoring the capping device in place against the heavy pressure of the escaping oil or gas. It avoids the previous difficulty of attempting to put a cap over the top of a pipe from which oil or gas is flowing under great pressure.



New English Supply Form

LONDON, May 24.—Vickers, Ltd., important English interests are now engaged in the manufacture of oil field equipment on an extensive scale. They have taken over, for manufacturing purposes, one of the big munition plants near London. Their catalog "Oilwell Leaflet A" states their bits are made under their own supervision from the manufacture of the steel to the final heat treatment. A specialty is a weldless jar which is forged from one piece and a single weld jar made with the striking faces hardened in order to lengthen its life.

The company states it is ready now to furnish oil well supplies generally, including, besides drilling tools, boilers, engines, derricks, rotary outfits with a diameter of 24 inches and so on.

Heretofore the only firms in England engaged in the manufacture of oil field equipment have been the Oil Well Engineering Co., Ltd., a branch of the Oil Well Supply Co. of America, and Perkins, Macintosh Petroleum Tool & Boring Co., Ltd.

NILES, O., May 27.—The Standard Boiler Plate Iron Co. of Niles has contracted to supply the Standard Oil Co. of Louisiana with a large number of tanks to be erected at Haynesville, Maryland and Baton Rouge, La. Shipment will be made early in June. This company also is building a refinery for the Blue Grass Refining & Producing Co. at Lexington, Ky., and furnishing tanks for the Stoll Oil Refining Co.'s new Cincinnati station.

Mail Order House Has Quit Grease Business

CHICAGO, May 26.—F. E. Martin & Co., Lake Bluff, Ill., reports the sale of the grease manufacturing plant of Montgomery Ward & Co., to the American Lubricant Co., of Dayton, O. The plant will be dismantled and removed to Dayton.

It was under the supervision of F. E. Martin that the mail order house installed the plant, and it was conducted under the name of the Brown-Lee Manufacturing Co. The plant has a capacity of several car loads of grease a day.

E. M. Hibbard, president of the American Lubricant Co., was formerly identified with the Sun Co., of Philadelphia. The company already manufactures textile and automobile lubricants, and the newly-acquired equipment simply will be used to increase the output. Mr. Martin will represent the company's interests here in Chicago.

The mail order house is not in the grease business any more. Its marketing department, which was run by O. B. Lloyd and W. H. Breckenridge, prior to October, 1921, was divorced from the rest of the business and has been operated independently since as the Lloyd-Breckenridge Grease Co.

Value Of Standard Oil Common Stocks Increases $592,000,000

CLEVELAND, May 29

COMMON stocks of the companies in the Standard Oil group have made more remarkable increases in their market values than the few Standard Oil shares and Independents that are listed on the New York Stock Exchange. The Standard Oil common shares of 31 companies not listed on the exchange and five companies whose issues are listed, increased more than $592,000,000 from their low figures early this year until the closing sales in New York May 26 or the last previous day when the stock was "out."

Of this great sum, which is almost equal to the entire capitalization of American railways a generation ago, $409,157,846 represents the increased value of Standard Oil shares sold outside the stock exchange but does not include the appreciation of Humble Oil & Refining Co., Magnolia Petroleum Co. or many other Standard controlled corporations. The increased value of the five Standard stocks listed on the exchange from their low prices to May 26 was $183,545,896.

Preferred Stocks Disregarded

The preferred issues of the Atlantic Refining Co., Standard of New Jersey and Union Tank Car Co., on the exchange, were not included in the compilation as common stocks reflect the earning powers of a corporation and consequently show the greatest variance as general industrial, economic and financial conditions change. Neither was the enhancement of the preferred issues of companies not listed on the exchange included, for the same reason.

By Roger B. Stafford
STAFF REPRESENTATIVE

The greatest jump in values was made by the Standard Oil Co. of Indiana whose appreciation was $133,126,964 or $25,766,509 more than the par value of its outstanding capital stock. The extensive market this company serves and the position the increase in the price of gasoline has put it in, has made it greatly attractive. Rumors that this company is in position to declare another stock dividend, also has attracted many investors who are anxious to sit in at a "melon cutting" if one is to take place. The market value of International Petroleum stock under recent active trading on the New York Curb has increased more than $58,000,000 and the Standard of New York has appreciated more than $53,000,000.

Ohio Oil Highest Priced

The value of the Ohio Oil Co. stock increased $33,600,000 or more than double its par value and the $25 shares were the highest priced of any oil share dealt in in America. The shares selling recently at 313—some a few points higher—brought the equivalent of 1252 if the par value were $100.

Stocks of the Imperial Oil Co. of Canada has enhanced $24,318,105 in value and Vacuum Oil Co. stock due, it is believed, to the better outlook in European and other foreign countries with which it does a large export business, has gone up $20,400,000. Likewise the Anglo-American Oil Co.'s 3,000,000 shares of £1 par value have increased $13,500,000 in value or the equivalent of their par at the highest recent sterling exchange rate.

One of the most interesting appreciations is that of the Standard of Kentucky which has increased 70 per cent in market value since the revamping in April of its capital stock, the payment of a 33 1-3 per cent stock dividend and granting of the right to subscribe to 33 1-3 per cent additional stock at par. It advanced from a low of 76½ following the appearance of the new $25 stock on the market to 94 the last week in May.

Of the five Standard Oil common stocks on the exchange, Standard of California has advanced $96,996,027 including May 26, or about 96 per cent of its par value. Standard of New Jersey had increased $73,750,130.

The increase in market value of 45 stocks listed on the New York exchange, as reported in the **National Petroleum News** for May 24, was $433,565,610. This list included the increases in the five Standard Oil stocks mentioned before and also the appreciation of the preferred issues on the exchange.

The accompanying table shows the standard group stocks traded in on the curb and exchange, their low prices for the year, par value, amount of common capital stock and amount of appreciation.

Unlisted Stocks

	Par Value	Year's Low	Close May 26 or Last Previous	Common Stock	Increase in Market Value
Anglo-American	£1	16⅝	21⅛	£3,000,000	$ 13,500,000
Atlantic Lobos	N. P.	8	11¾	(sh) 500,000	1,875,000
Buckeye Pipe	50	84½	96	$10,000,000	2,500,000
Chesebrough	100	177	198	1,500,000	315,000
Continental	100	125	144	9,941,530	1,888,890
Crescent Pipe	50	28	36	3,000,000	480,000
Cumberland Pipe	100	115	141	1,500,000	390,000
Eureka Pipe	100	79½	100	5,000,000	1,025,000
Galena-Signal	100	40	56	16,000,000	2,560,000
Imperial, Canada	25	97½	113	39,222,750	24,318,105
Illinois Pipe	100	161	177	20,000,000	3,200,000
Indiana Pipe	50	84	96½	5,000,000	1,250,000
International Pet	N. P.	14	22¼	(sh)7,118,138	58,724,639
National Transit	12½	27	30	6,362,500	1,527,000
New York Transit	100	142	175	5,000,000	1,650,000
Northern Pipe	100	90	108	4,000,000	720,000
Ohio Oil Co.	25	257	313	15,000,000	33,600,000
Prairie Oil & Gas	100	520	600	18,000,000	14,400,000
Prairie Pipe Line	100	224	245	27,000,000	5,670,000
Penn-Mex Fuel	25	17	28½	10,000,000	4,600,000
Southern Pipe	100	77	103	10,000,000	2,600,000
South Penn Oil	100	165	220	20,000,000	11,000,000
S. W. Pa. Pipe Line	100	52	61	3,500,000	315,000
S. O. Indiana	25	83¾	114¾	107,360,455	133,126,964
S. O. Kansas	100	500	570	2,000,000	1,400,000
S. O. Kentucky	25	76½	94	10,000,000	7,000,000
S. O. Nebraska	100	170	200	3,000,000	900,000
S. O. New York	100	341	412	75,000,000	53,250,000
S. O. Ohio	100	390	460	7,000,000	4,900,000
Swan & Finch	100	30	34	1,806,200	72,248
Vacuum Oil	100	299	435	15,000,000	20,400,000
Total					**$409,157,846**

New York Exchange Stocks

Atlantic Refining	100	900	1090	50,000,000	9,500,000
Pierce Oil Corp.	25	7	10	23,747,825	2,819,739
S. O. California	25	91¾	115⅞	100,507,800	96,996,027
S. O. New Jersey	25	169	187¾	98,338,306	73,750,130
Union Tank Car	100	96	100	12,000,000	480,000
Total					**$183,157,846**
Grand Total					**$592,703,742**

Chickasaw May Re-Open

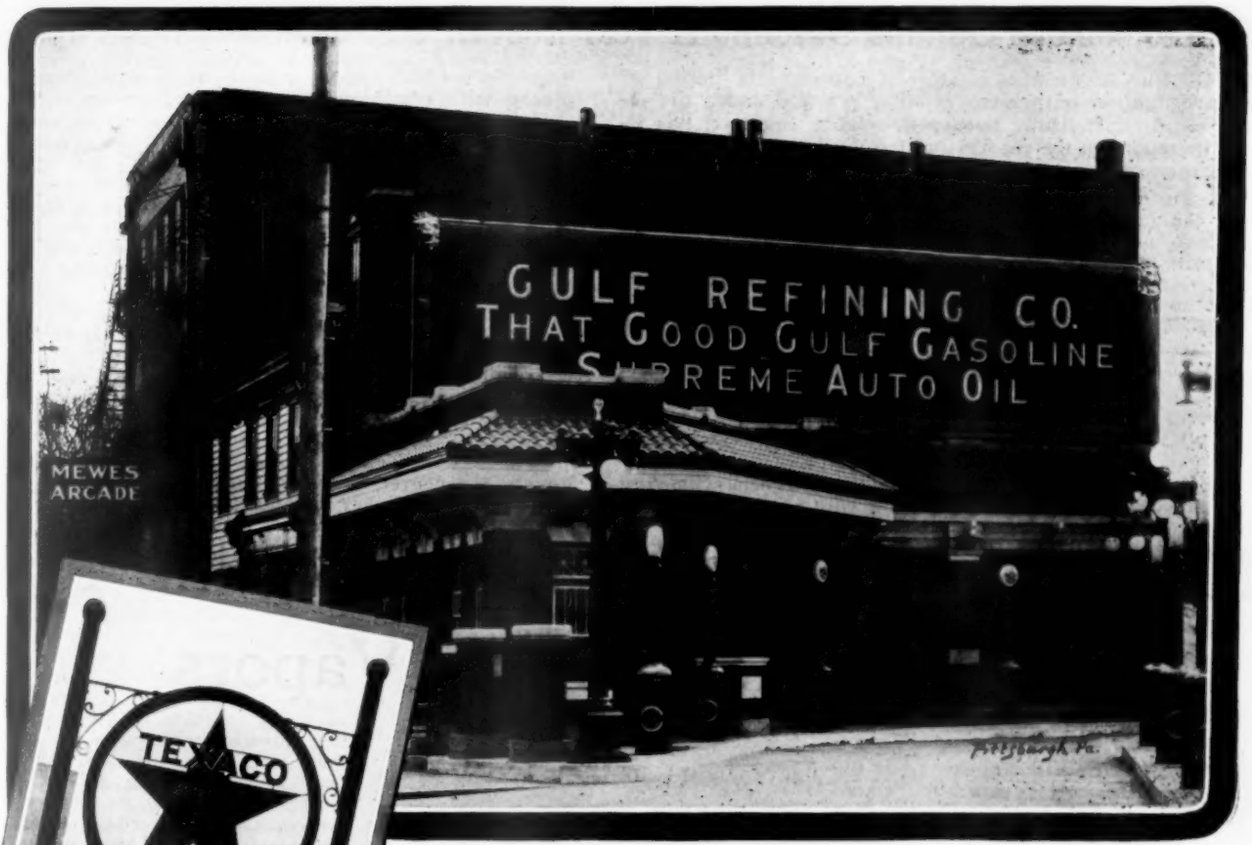
TULSA, May 26.—Plans for refinancing the Chickasaw Refining Co. of Ardmore, and for opening the plant were discussed at the annual meeting held at the general offices there yesterday. The following officers and directors were elected:

S. A. Apple, president; Erret Dunlap, vice president; Perry D. Maxwell, vice president; F. O. Schneider, secretary-treasurer, and John Holt, assistant secretary-treasurer. All the members of the board of directors were re-elected, including S. A. Apple, chairman, Erret Dunlap, John S. Owens, Perry Maxwell, Charles Von Weise and Ernest L. Nye. All the officers and directors are residents of Ardmore with the exception of Mr. Nye, who is from New York.

Union Bowlers Win Trophy

PHILADELPHIA, May 25.—The Union Petroleum Co. bowling team, winners of the first half season, and The Texas Co., winners of the second half, rolled for the Oil League championship of Philadelphia on May 16. The Union team won the first two games and the silver cup championship trophy. The Union team has won the championship three of the last four seasons.

The teams in the Oil League are: The Texas Co., Gulf Refining Co., Atlantic Refining Co., Crew Levick Co., Sun Co., and Union Petroleum Co. Union Petroleum bowlers are: D. A. Froelich, captain; J. L. Toomey, W. A. Tracey, F. J. Keyser, F. A. Knight, W. J. Robinson, L. V. Stanford and J. J. Schratt.



Flexlume Signs

Put The Touch of Quality On Filling Stations

FLEXLUME Electric Signs with their letters of *raised,* snow-white glass standing out in relief from a dark background add a certain touch of quality to their surroundings. That is one reason large distributors are putting them on their filling stations.

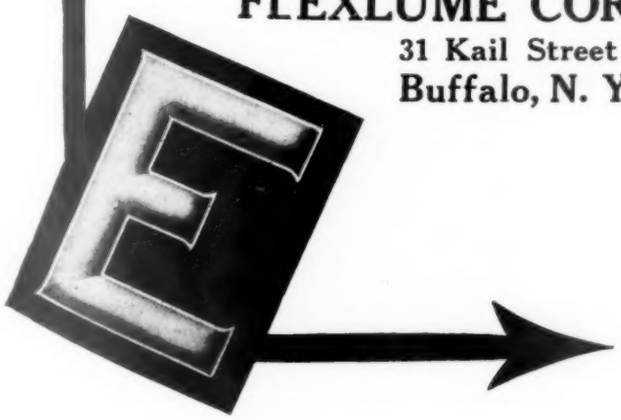
Another reason is that practically any trade name or design can be perfectly reproduced in the *raised,* Flexlume characters.

Flexlumes are day signs as well as night signs — *raised,* snow-white glass letters on a dark background. At night when the lights are on the background seems to blend into the darkness and only the characters stand out, each one a solid letter of light, clear-cut, distinct, no broken outlines.

Among the other Flexlume advantages are greatest reading distance, lowest upkeep cost, most artistic designs.

Let us send you a sketch showing a Flexlume to meet the particular needs of your business.

FLEXLUME CORP.
31 Kail Street
Buffalo, N. Y.



Flexlume Corporation
31 Kail St., Buffalo, N. Y.

Please send me without charge sketch showing Flexlume sign.

Sign should read .....
.....
.....

Single or Double Face .....
Vertical or Horizontal .....
Name .....
Street .....
City .....

120,000,000 Gallons Gasoline A Year Lost In Uncondensed Still Vapors

THE Bureau of Mines, after a considerable period of investigation of present refining practice under the direction of D. B. Dow, bureau petroleum engineer, has issued its report on the recovery of gasoline from uncondensed still vapors.

In this investigation the bureau has undertaken principally the gathering and study of what is already being done by some individual plants in the saving of that portion of the light fractions that escape in vapor form through the condensers. It has supplemented this with some research work at the Bartlesville station. Its report represents a comprehensive survey of practice east of the Rockies in this particular phase of refining practice.

The average plant operator, particularly in districts where it is difficult or impossible to keep condenser temperatures low, will find the report of much value, since it is a phase of refining practice pretty largely neglected by the small plant.

National Petroleum News herewith republishes the first portion of the official report, dealing with the nature of the uncondensed still vapors from both skimming and pressure plants, with conditions governing the amounts of gasoline recoverable and with methods of collecting the uncondensed vapors. A short preliminary section of the report describing general refining practice is omitted.

Following portions of the report, dealing with methods of handling sulphur in uncondensed still vapors, and with both the compression and absorption methods of treating the still vapors to recover the gasoline content and with the cost features of the problem, will be republished in later issues.

In general the bureau estimates that application of a system or systems for recovering still vapors at all refineries would give an additional gasoline recovery of 170,000,000 gallons annually. About 50,000,000 gallons of this is now recovered. An average cost is given, for installing recovery plants, of $15 per gallon of gasoline (daily capacity). Type of plant, nature of crude run and average temperatures secured in condenser operations are factors which govern the degree to which the still vapors escape condensation under ordinary refining practice.—Editor.

Methods For Recovering Gasoline From Uncondensed Still Vapors

Part I

By D. B. Dow
PETROLEUM ENGINEER, BUREAU OF MINES

UNCONDENSED vapors from the condenser are generally classified under two heads, "sweet gas" and "sour gas." The term "sweet gas" refers to those vapors remaining uncondensed during the distillation of the lighter ends of the crude. In the batch process these vapors are formed with the light and heavy napthas, and in the continuous process from the first few stills of the battery, which remove the napthas. The term "sour gas" refers to those vapors formed by cracking, either in tar stills or in pressure stills. This term is very descriptive, since cracked gasses are largely unsaturated and have the marked odor peculiar to cracked products. Sulphur compounds are usually present in cracked gases and are partly responsible for the unpleasant odor.

The distillation process that is used not only governs the nature of the gas, but also the amount that is formed from a definite quantity of crude. A skimming plant that removes only gasoline, kerosene and gas oil will not produce the same amount of vapor as a plant that is equipped with pressure stills or one that is producing comparatively large quantities of cracked gases in distilling down to coke.

In skimming plants practically all the vapors that remain uncondensed are formed during the distillation of the first 15 per cent of the crude. After this fraction has been removed the vapors consist largely of hydrocarbons that can be readily condensed at temperatures maintained in the ordinary condenser. In addition to the uncondensed vapor from the crude stills, large quantities of vapor remain uncondensed when the naptha fractions are rerun in the steam stills.

With these two sources of gas it is rather inexpensive to install gas lines for removing the vapors as rapidly as formed. The problem of collecting the vapors is correspondingly simple, since the lines from both sources can be joined and taken to a central point where a small vacuum is held. The gas can then be treated either by compression or absorption. There is generally no need for "scrubbing" this gas to remove sulphur, since the sulphur content of the gas from the naptha fractions of the crude is very low and not objectionable. In some plants an even simpler installation is made, consisting of a 6-inch header into which the gas passes under its own pressure. This header is cooled by sprays, and recovers a considerable quantity of gasoline. The entering gas is nearly all gasoline vapor without any appreciable amount of permanent gas. Tests of this type of gas have shown it ito contain as much as 30 gallons of gasoline per 1000 cu. ft. of vapor. In other words, as high as 90 per cent of the vapor can be condensed and held as gasoline. In the plants visited by the writer an average of about 7 gallons per 1000 cu. ft. was obtained.

The conditions existing in refineries operating pressure stills are different from those at skimming plants. Uncondensed vapors are obtained not only from crude and steam stills, but also from pressure stills. Large amounts of very rich uncondensed vapor are also obtained from the rerunning of pressure-still distillate. These vapors yield as high as 24 gallons of gasoline per 1000 cu. ft. Experiments have shown that in running a barrel of Cushing crude about 52 cu. ft. of vapor remains uncondensed. Under the same conditions of condensation a barrel of gas oil distilled under pressure gave 163 cu. ft. of gas with an average gasoline content of 2.8 gallons per 1000 cu. ft. In distillation under pressure large quantities of fixed gases are formed. When the gas from cracking stills is added to the gas from the crude oil and steam stills, the gasoline content of the mixture will be lower than that of the gas from the latter two sources. The volume of gas, however, will be so increased that the total amount of gasoline recovered will be considerably greater.

Since the sources of gas are more widely separated in a refinery of this character, the problem of installing a recovery system is much more complicated than in a skimming plant. In the latter, the gathering line takes gas only from the crude stills that are running light distillates and from the steam stills, whereas in the complete refinery the gases are obtained from crude, steam, pressure and rerun stills. This requires a much more extensive system of gathering lines, and careful provision for covering distances not met with in skimming plants. If the gases are all collected by one central exhauster, as is usually done, there is danger of too high a vacuum being held on some of the stills, while on account of the frictional resistance in long lines and the small amounts of gas produced, those stills at a greater distance may be under no vacuum at all.

The removal of sulphur is generally necessary in a refinery which uses pressure stills, because the hydrocarbon sulphur compounds are thrown down at the existing temperature and pressures. This would result in considerable trouble from depositions of sulphur, and large expenditures must therefore be made in providing scrubbers for the removal of sulphur.

Atmospheric temperature is an important factor in the production of gasoline from uncondensed refinery vapors. It is found that, during winter months, due to more complete condensation of the vapors, the production of the "gas" plant will fall off to some extent. An unusual example of this is a certain skimming plant which produces about 6000 gallons of compression gasoline daily through the summer months, but drops to as low as 500 gallons per day in the winter. Ordinarily, the difference is far less, but there is always a tendency for production to drop in cooler weather. Another factor which tends to produce this result is where the evaporation from storage tanks is picked up and recondensed. This evaporation, of course, is much greater during the summer months.

Three other factors which determine the gasoline content of the uncondensed vapors are the nature of the still charge, the temperature of the stream, and the vacuum carried on the run-down lines.

The distillates from crude oil which has only a small amount of low-boiling fractions will condense very easily. The loss

in uncondensed vapor from this type of crude is very low when compared with the losses from a crude with a very high gasoline content. Likewise, the amount of vapor remaining uncondensed during distillation in the steam still depends upon the charge. For example, a light naptha forms more gas than a heavier distillate.

The vacuum carried on the run-down lines influences the yield of vapor, since any increase in vacuum causes a corresponding decrease in boiling points of the distillate. The vacuum carried should be as low as possible and only serve to remove the vapors formed, rather than to lower the boiling point of the charge being distilled.

The temperature of the stream is an important factor, since with an increase in the temperature of the distillate there is a corresponding increase in the gasoline content of the gas. The temperature of the stream depends in turn upon the temperature of the cooling water in the condenser and upon the rate of distillation. These two factors determine the condenser surface per gallon per hour. For light fractions the condenser surface is generally about two square feet per gallon per hour. If this figure is lowered the gasoline content of the vapors will become higher, and if raised the gasoline content will be lower, provided, of course, that the temperature of the cooling water is constant.

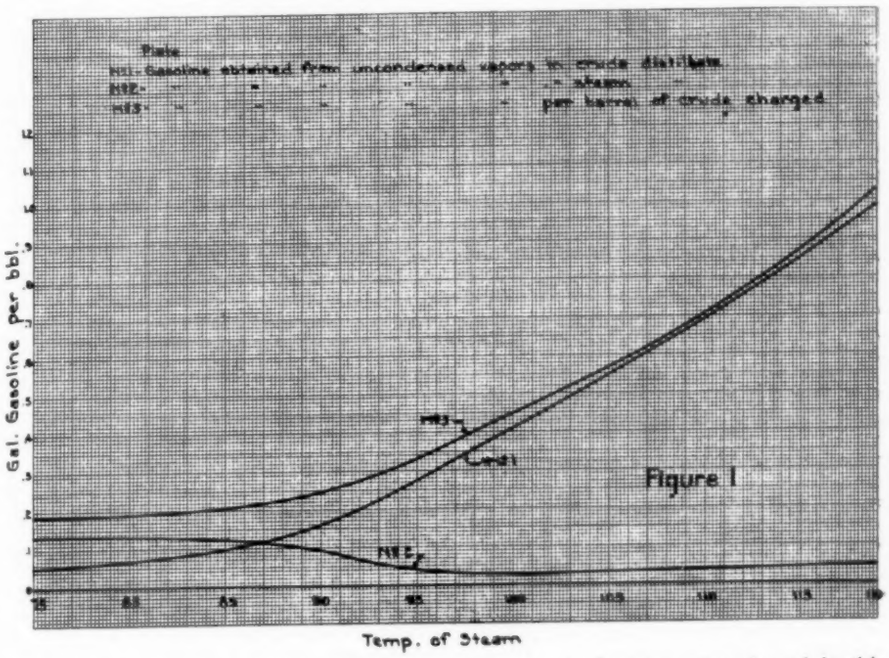
Gasoline Recoverable From Vapors

In an effort to determine as nearly as possible the effect of the temperature of the stream on the uncondensed gasoline, a series of runs was made in the Bureau of Mines experimental refinery at Bartlesville, Okla. Cushing crude of a gravity of 38.5 Be. was used, with a condenser surface of two square feet per gallon per hour. The vapors were drawn off under a vacuum of two inches (of water) and collected in a small test absorber, filled with "mineral seal" oil as an absorbent.

After each test run, the absorbed gasoline was distilled by the usual laboratory method. Figure 1 shows results obtained. It will be noted that the yield of gasoline from the uncondensed vapors of the crude still increases with the temperature of the stream. The gasoline content of the uncondensed vapors, per barrel of crude charged to the still, varies from 0.05 gallon at a stream temperature of 75° F., to 1.01 gallons at 120° F.

The gasoline produced from the crude still at each stream temperature shown, was redistilled in the steam still at the stream temperature. For example, gasoline produced from the crude still at a stream temperature of 75° F., was redistilled at a stream temperature of 75° F., gasoline produced at a stream temperature of 90° F., was redistilled at 90° F., and so on. The amount of gasoline obtained from the uncondensed vapors from the steam still, decreases as temperatures of stream increase. When the stream from the crude still has a temperature of, say 75° F., the vapors are so cooled that little gasoline remains uncondensed. The condensate is redistilled in the steamstill with the stream temperature at 75° F., the vapors are much richer in high gravity hydrocarbons than the vapors from the crude, and this results in a larger amount of vapor remaining uncondensed.

With the stream running at 90° F. from both crude and stream stills, the increased amount of uncondensed vapors from the crude distillation results in a lower recovery of gasoline from the uncondensed vapors of the steamstill. In other words, the distillate charged to the steam still has been robbed of the lighter fractions, so the amount of vapors uncondensed in this distillation is smaller than in the previous run. As the temperature of the stream from both stills increases, the quanity of uncondensed gasoline from the steam still decreases, until at 120° F., practically all of the light fractions that will remain uncondensed have been taken off at the crude still condenser.



The total gasoline obtained from the uncondensed vapors from both the crude still and from the steam still is shown in curve 3, Figure 1. This indicates the amount of gasoline that can be recovered under like conditions in refineries operating on Mid-Continent crude.

The following information on amounts of uncondensed vapor obtained from different crudes was supplied by Franklin

TABLE I SHOWING GENERAL DATA ON PLANTS THAT RECOVER GASOLINE FROM UNCONDENSED STILL VAPORS

Index	Nature of Refinery	Nature of Crude	Type of Scrubber for Removal of Sulphur	Sulphur Content	Type	Exhauster Vacuum carried ins. of water	Crude Charged Bbls. per Day	Cu. Ft. of Gas per Day	Gas. per Day, gal.	Gasoline Recovered per Bbl. of Crude Charged Gals.	Pct. of Crude Charge
1	Complete	Mid-Cont	Lye	High	Rotary	4	20,000	3,500,000	14,500	.72	1.71
2	Complete	Mid-Cont Mexican Penn.	Lye	Very High	Rotary	1	12,246	1,382,977	11,203	.84	2.00
3	Complete	Penn.	None	Very High	Rotary	6-8	25,000	5,000,000	12,000	.48	1.14
4	Complete	Penn.	Iron Oxide	Very High	Rotary	2	40,000	2,560,000	14,100	.35	.83
5	Complete	Mid-Cont Illinois Ohio	Lye	High	Rotary	3	40,000	5,600,000	16,000	.40	.95
6	Skimming & Lubricating	Mid-Cont	None	Low	Intake on Compressor	1	10,000	700,000	4,200	.42	1.00
7	Skimming & Lubricating	Mid-Cont	None	Low	Intake on Compressor	1	4,200	350,000	2,780	.65	1.55
8	Complete but no asphalt or coke	Wyoming	None	Low	Rotary	1½	30,000	875,000	7,859	.26	.62
9	Complete	Mid-Cont	None	Low	Rotary	1	12,000	*	8,000	.67	1.59
10	Complete	Electra Ranger Healdton	None	Low—No sour gas Treated	Intake on Comp.	2	38,000	*	5,000	.13	.31
11	Complete	Gulf Coast North Texas La.-Mex.	None	Varies with crude	Intake on Compressor	2	55,000	*	10,000	.18	.43
12	Complete	Oklahoma North Texas	None	Rather High	Rotary	2	33,000	6,331,000	21,000	.63	1.50
13	Complete	Mex.-La. North Texas Gulf Coast	Water Scrubbers	High	Rotary	3	35,000	4,000,000	2,000	.05	.12
Total							355,486		128,651 Avg. .444		Avg. 1.05

*No data on gas volume

Stroud, Jr., of the Atlantic Refining Co., Philadelphia. Somerset and Mid-Continent crudes give approximately 4 cu. ft. of vapor per barrel of crude charged, at a stream temperature of 70° F., and Mexican crude, 3 cu. ft. The vapor from the two former contains 12 gallons of gasoline per 1000 cu. ft., and from the latter, 10 gallons. The number of cubic feet of uncondensed vapor varies three per cent for every two degrees between 50° and 90° F., which gives the following formula for this range:

$$\text{Gallons per barrel} = \frac{A}{1000} \times \left(F + \text{or} - \frac{T}{2} \times .03\right)$$

Here A represents the number of gallons of gasoline per 1000 cu. ft. (12 for Mid-Continent crude and 10 for Mexican crude); F the number of cu. ft. at 70° F. for each crude, (4 cu. ft. for Mid-Continent and 3 for Mexican crude); and T the degrees difference in the temperature of the stream from 70° F. This gives a straight-line curve which checks the part of curve 1, Figure 1, below 90° F. Above 90° F. this formula would not apply, since the amount of uncondensed gasoline increases more rapidly with each succeeding rise in temperature.

Experimental Results of Pressure Still Distillation

On cracked gases, which include gases formed in running crude to coke, gases from pressure stills and gases from the running of pressure-still distillates, Mr. Stroud gives the following: Mexican light crude, 200 cu. ft. of gas per barrel charged, containing four gallons of gasoline per 1000 cu. ft.; Mid-Continent crude, 80 cu. ft. per barrel with a gasoline content of seven gallons per 1000 cu. ft.; average slop, 120 cu. ft. per barrel; with five gallons of gasoline 1000 cu. ft.; average slop, 120 cu. ft. per barrel; with five gallons of gasoline recoverable per 1000 cu. ft.; gas oil, in pressure stills, 140 cu. ft. per barrel with a gasoline content of three gallons per 1000 cu. ft., with a variation of 2½ per cent in the quantity of gas for every hour over or under 38 hours per 1000 barrels. In tests conducted by A. J. Rodgers of the Tide Water Oil Co.

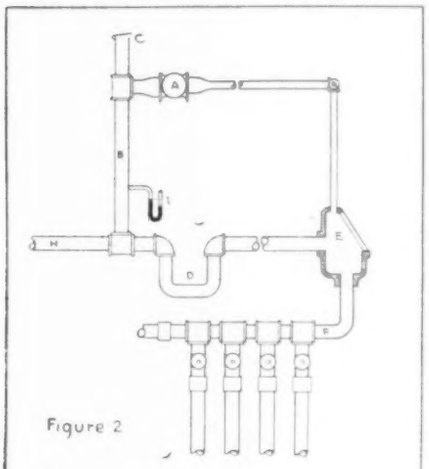


Figure 2

A.—Main gathering line or header.
B.—Riser carrying gas to header.
C.—Clapper valve to prevent pressure.
D.—Gas trap.
E.—Look box.
F.—Manifolds.
G.—Small header carrying gas from look box, either to vent or gathering line.
H.—Run down line from condenser.
I.—U tubes registering vacuum in water held on the run down line.

Acknowledgment

Mr. Dow in his report on gasoline from uncondensed still vapors acknowledges the assistance of J. O. Lewis, A. W. Ambrose, H. H. Hill, E. W. Dean, C. R. Bopp and N. A. C. Smith, all connected with the Bureau of Mines at the time the investigation was made.

"Messrs. H. R. Harwood, N. E. Loomis, T. G. Deloridge, H. H. Rathvon, J. Hansen, A. S. Hopkins, J. W. Newton, William Slater, and John Noble, co-operated by permitting inspection of their plants. Messrs. W. E. Espey, A. J. Rodger, W. F. Stroud, R. L. Spencer and H. G. Smith furnished data on operating methods and experimental results in several refineries which recover gasoline from uncondensed still vapors. Also, valuable information was obtained from Messrs. W. H. Leavitt, W. D. Rial, R. O. Neal and I. P. Parkhurst."

where the pressure on the still amounted to 95 pounds, 95 cu. ft. of gas was obtained from each barrel charged. The specific gravity of this gas was about 0.85.

Experiments in pressure-still distillation by W. E. Espey of Cosden and Co., Tulsa, Okla., showed that 163 cu. ft. of gas was produced per barrel of gas oil charged to the still. This gas had an average gasoline content of about two gallons per 1000 cu. ft.

An accompanying table shows representative refineries on the Eastern coast, Gulf coast, in Oklahoma, Wyoming and Kansas that have installed plants for treating uncondensed still vapors. Column 10 shows that in these plants the recovery of gasoline ranges from 0.05 to 0.84 gallons per barrel of crude charged. Where the recovery value is low, several refineries do not have efficient recovery plants, and others have not been fully equipped for taking care of all the gases formed. In some it is due to the low gasoline content of the crude and to the absence of pressure stills. Others are equipped with pressure stills, but do not utilize the cracked gases because they lack equipment for removing the large sulphur content usually fond in such gases.

The figures on crude charge, volume of gas and gasoline recovered are average figures, and of course, vary greatly from time to time. The greatest error probably exists in the figures for gas volumes since a number of these have been calculated from compressor displacement.

The total crude oil charged to the refineries listed in this table amounts to 355,486 barrels a day. By treating the uncondensed still vapors in these refineries, a total daily gasoline yield of 128,651 gallons is obtained. This shows an average recovery in these plants of 1.05 per cent or 0.444 gallon of gasoline for every barrel of crude oil charged. If the gases were not treated, this amount would be lost or burned as fuel.

Collection of Uncondensed Vapors

In distilling crude petroleum the first vapors or gases driven off are naturally the lightest hydrocarbons and have the highest vapor pressure of any hydrocarbons present in the crude. In order to condense these vapors, it is necessary to have condenser coils with large surface area held at low temperatures.

Under these conditions all the vapors would condense except the very lightest, which would be more correctly called permanent gas than gasoline vapor. The small amount of gas left uncondensed would under these conditions be almost entirely dissolved in the condensate. Ordinarily, however, the temperatures of the condenser boxes are high enough so that a large part of the first few per cent distilled remains uncondensed. By removing these vapors as rapidly as they are formed, and by submitting them to subsequent compression and cooling, or by dissolving them in a low gravity oil, a large part of such vapor can be recovered as gasoline.

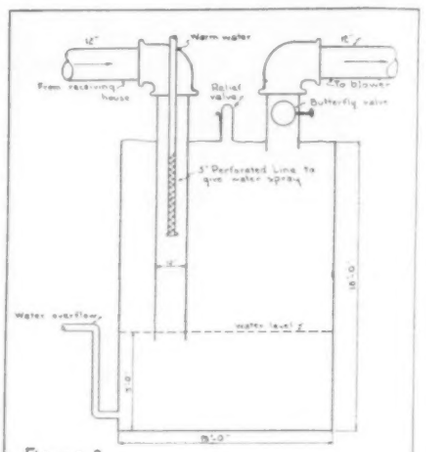


Figure 3

Type of trap used which washes gas and provides relief valve for excess pressure and butterfly valve to prevent excess vacuum.

After passing through the condensers, the vapors can be removed from the run-down lines at any point. Sometimes they are taken from the bottom of the coil by a riser passing upward through the water in the condenser box. This arrangement is less desirable than taking the gas off outside the condenser box, as the latter method cuts down repair costs. More frequently, they are removed at the "tail-house." A goose-neck or trap is usually placed between the gas gathering line and the "look-box." This prevents air from being drawn into the line from leaks in the "look-box." A small vapor line is also frequently seen leading from the look-box to the gathering line, but in most cases, it discharges into the air (Fig. 2), since the amount of gas led off from this point is very small and would be largely diluted with air leaking into the look-box.

The risers from the bottom of the worm, or from the goose-neck, vary in diameter, depending on the volume of gas to be handled, generally from 1¼ to 3 inches. In a large plant with several tail houses, the small risers enter a larger line which, in turn, discharges into a still larger main line leading through the trap to the gas plant.

A vacuum held on these lines is so regulated that the vapors are removed as rapidly as formed. In the different plants visited, this vacuum varies from ½-inch to six inches of water. As regards best general operation, 1-inch would probably be sufficient, since

higher vacuums cause a considerable amount of the condensate to be re-evaporated and may also produce a vacuum on the still which is to be avoided. Great difficulty is experienced with higher vacuum from leakage of air into the lines. In some refineries, vacuum valves are used and in case the vacuum becomes too high on any unit, these valves open and permit air to enter. On other plants, instead of this valve, a small "clapper" valve is situated on the top of each header. This serves the opposite purpose, for should the pressure of the still exceed the vapor capacity of the vacuum line, the valve permits the excess vapor to escape.

A simple and efficient device to avoid pressure from the still is a 2-inch pipe which extends from a tee at the top of the gas riser to about 2 inches below the water surface in the condenser. If the pressure in the gas line becomes more than two inches of water, gas will escape through this pipe and relieve the pressure. The pipe should be long enough so that any excess vacuum will not draw water into the gas line.

A combination of these valves is desirable, so that the still will never be under any pressure or vacuum resulting from the gas system.

Traps on Gathering Lines

In building a recovery system for uncondensed still vapors, it is well to install traps between the exhauster or intake of the compressor and the source of the gas. These traps serve several purposes; they remove condensate caused by air cooling or any heavy products carried over mechanically which would destroy lubrication in the exhauster or compressor; they act as a pressure equalizer, so that no sharp changes of pressure will take place on the run-down lines; and they serve to remove sulphur.

In the different refineries visited the traps were practically of the same type, consisting of a steel tank varying in size from about 4 ft .in diameter by 5 ft. high, to 15 ft. in diameter by 18 ft. high. In these traps the gas receives a preliminary washing with water, which removes sulphur, condensate, and heavy hydrocarbons, carried over mechanically.

Various methods of washing are used, from a simple gas inlet below the water level, to a small perforated water pipe placed inside the gas inlet pipe, which sprays the gas before it passes through the water seal.

In some plants traps are placed at every "tail-house," and in others only one large trap at the exhauster house. In one refinery visited where a trap is installed at each unit, a steel tank 15 by 18 feet is used. A 12-inch gas intake line enters the top and drops to within three feet of the bottom where the gas bubbles upward through water, after being washed by a spray. The washed gas rises and leaves the trap by a line from the top, where it goes directly to an exhauster. A diagram of this trap is shown in Figure 3.

Valves on Traps

The trap previously described has a relief valve which vents gas into the air whenever pressure builds up on the lines, and thus prevents trouble at the still. A butterfly valve is regulated from time to time to hold the same vacuum on the run-down lines. Regulating devices of this sort are necessary since the volume of gas given off from the condenser coils varies through wide ranges, and in case the vacuum carried on the trap is not sufficient to handle the vapors as rapidly as they are formed, back pressure is built up on the still. This condition should be avoided. The amount of gas formed varies with changing conditions, such

Shows trap receiving gas from header on run-down lines

as temperature of water, difference in crude, and so on. If the vacuum carried on the lines is so high that the gas formed is not sufficient to compensate, a vacuum would be exerted directly on the still. This condition should also be avoided. There should be just enough vacuum on the lines to take care of the vapors, no more, no less. This will always give the same conditions of pressure as if the uncondensed vapors were passing directly into the air.

In some plants, the condensate formed in these traps is wasted into the sewer, but in other plants it is recovered from the surface of the water.

Exhausters for Gathering Vapors

The recovery systems installed in complete refineries are necessarily much larger and much more complicated than in skimming plants, since the wide separation of sources of gas makes it difficult to carry the same vacuum on all run-down lines. Skimming plants with a crude charging capacity fully as large or larger than complete refineries have a smaller number of stills, and this results in shorter and less complicated gathering lines. In a plant of this character an exhauster is not necessary, as the vacuum needed for gathering the vapors can be developed by the intake of the compressor.

In complete refineries, however, where various types of stills are all being used, the area of the plant is much larger, the gases formed differ widely in composition and volume, the pressures vary over wide limits and the gathering lines are more complex and much longer. Hence in this type of refinery, installations must be made which will gather all of these different gases without allowing pressure to build up on any still that is making a large amount of gas, or without producing a vacuum on a still that is making very little gas.

Positive-pressure, rotary blowers or exhausters are used for gathering uncondensed vapors, since they fill the requirements better than any other type of compressor or blower. They can handle large volumes of gas, hold a vacuum on the run-down lines of one to four inches of water, and discharge at a pressure high enough to force the gas through the sulphur scrubbers. A reciprocating machine is not so practical for this work, since a machine capable of handling large quantities of gas at the low pressures would be so large that the installation and operation would be prohibitive. In such a machine the surface friction of the gas due to the high velocities through the valves and ports, for large volumes at low pressures becomes very high, as compared with that in the rotary exhauster with its large inlet and discharge openings and attending low velocity. The mechanical friction in the rotary machine is very low, since it is confined to slow speed journals and gears which run in oil. In the piston machine the mechanical friction is much higher, because there is considerable friction in the piston and rod packing, journals, valve gear, and sliding parts.

The fan or turbo machine which might be used has the disadvantage of loss of mechanical friction, by journals running at high speeds, and leakage loss due to the fan not fitting the shell. Corrosion of the thin steel blades also gives continuous trouble. These disadvantages are all eliminated in the rotary blower which results not only in better and cheaper operation but also eliminates shut-downs for repairs. Due to these advantages, the rotary exhauster requires very little attention.

In one refinery visited, two exhausters are used, which have a daily capacity of 2,500,000 cu. ft. of gas. These exhausters have been used for several years and after a series of operating tests employing different methods of lubrication, it was found that best results were obtained by feeding a half gallon of 50-54 naptha into the exhauster in a half-hour, followed by feeding lubricating oil for about 5½ hours. This operation is then repeated, with the result that in 24-hour runs two gallons of the naptha and two quarts of lubricating oil are used.

With this method of lubrication no trouble is ever experienced. In eight years' time there has been only one forced shut-down, which was due to accumulation of sulphur. It is now the practice to take the blowers apart once a year and clean out any sulphur that may have been deposited.

Gasoline Tax Disappoints

SHREVEPORT, La., May 26.—The Louisiana 1-cent a gallon gasoline tax has failed to raise the revenue expected of it, it became known this week at a hearing concerning the finances of the state highway department at Baton Rouge. It was estimated early this year that the gasoline tax would yield about $60,000 a month. Collections have ranged from $34,000 to $40,000 a month. Chairman William T. Peterman of the state highway commission said he believed the tax would bring but $450,000 to $500,000 this year, instead of the estimated $720,000.

Says Tax Increase Will Curtail Output

By Special Correspondent

SHREVEPORT, May 25.—A warning that operations will be curtailed if the state levies an excessive tax upon gross oil production as some of the legislators are hoping to levy, has been given in the following statement issued at the state capital this week by Bradford Hearn of Shreveport, assistant general manager of the Shreveport Producing & Refining Corp., referring especially to the proposed increase in the severance tax, now 2 per cent:

"If we continue to tax the industries of the state in an excessive amount it will ultimately mean that the producing industries will cease to develop. The potential oil-producing area of Louisiana has scarcely been touched, but I am satisfied that if the legislature increases the tax to three per cent it will retard development and the state will receive less money from taxation than it now receives.

"If the state levies an excessive tax upon the gross production the oil companies must curtail operation. Therefore a three per cent tax on the gross production will probably not yield the state as much revenue as the two per cent tax now in effect."

According to advices from Baton Rouge, at an informal caucus of 30 odd members of the legislature, decision was reached to support the Schell severance tax bill as written. This measure is the counterpart of the Alexander 2½ per cent bill of last year, save that it stipulates a 3 per cent tax on gas and oil, with the proviso that one-third of the tax shall be returned to the parish of origin. At present the severance tax is 2 per cent, all going to the state. The Schell bill does not touch on state division of funds derived from the severence tax, with reference to eleemosynary institutions, agricultural colleges or general fund.

The ways and means committee has announced that severance tax legislation will be the subject of a public hearing May 31, when about 50 persons are expected to present their views.

Third Producer In In Mid-West Field

TULSA, May 29.—In the Mid West pool south of Okemah, Okfuskee county, the third producing well has been brought in. It is the No. 1 of the Oklavania Oil Co., located in the center of the north line of the northeast quarter of the northeast quarter of 11-10-9 which has been drilled four feet into the sand encountered at 3137 feet and is making 35 barrels an hour. This is an offset to the Independent-Kemp well in Sec. 12 which is making about 1200 barrels. The Oklavania has rigs up for Nos. 2 and 3 on the lease and they will be drilled at once.

The Roland Oil Co.'s latest well west of Bristow, Creek county, in the northeast quarter of 23-16-8 is now estimated good for 1000 barrels at four feet in the sand topped at 3150 feet. The same company's No. 1 Alex in 2-15-8 is now making about 9000 barrels daily. Several rigs are going in in the vicinity of the Roland well in 16-8. Robinson and Fletcher have a rig on the ground for their No. 1 Miller located in the southeast corner of the west half of the southwest quarter of Sec. 14 of the Roland well and Frank Billingslea has made a location for a test in the southeast corner of the northeast quarter of Sec. 22.

In the Mannford district, Pawnee county, an offset to the well of Gillette et al., completed several weeks ago has been brought in by the McMan Oil Co. in the southeast corner of the northwest quarter of 36-20-8 being that company's No. 1 Sample. This well is in sand from 2971 to 2986 feet and is now making 500 barrels daily.

In the Bristow field, Creek county, Waite Phillips No. 2 Colaw, located in the southwest quarter of 22-16-9, is making 170 barrels an hour at nine feet in sand topped at 2922 feet.

Good Well At Currie

HOUSTON, May 29.—Humphreys-Texas Co.'s No. 5 Meador, on the discovery tract in the Currie-Wortham pool of Navarro county came in making 1400 barrels at the Woodbine sand level having enough gas to flow it and the production showing only a very little water. Southward from the Meador tract the same company's No. 2 Cole is making 15 million cubic feet of dry gas at 2965 feet.

PHILADELPHIA, May 27.—"The Prosperity Special" was the name applied to a train of 20 oil burning locomotives that left the Baldwin Locomotive Works here this week consigned to the Southern Pacific railroad. This was a part shipment on an order for 51.

Humphreys-Pure Oil Line Makes Shipment

HOUSTON, May 30.—Humphreys-Pure Oil Pipe Line Co. on May 29 made the first runs of Mexia crude the full length of the line to its tidewater terminal at Smith's Bluff, near Port Arthur. The 205-mile pipe line had been in operation previously for part of its length but flood conditions had held back temporarily shipments its full length until now. President W. P. Gage announces that the first ship to sail from the Smith's Bluff terminal will be the S. S. Eugene V. Thayer, carrying a cargo for Marcus Hook where the Pure Oil refinery is located.

Plan Pipe Line Tax Test

KANSAS CITY, May 29.—Assistant United States District Attorney W. W. Harvey received permission today from Attorney General Daugherty to institute a suit to test the validity of the federal tax on oil transported by pipe lines. Judge John C. Pollock of the Federal Court in Kansas City, suggested the suit last week after arguments on an injunction suit brought by three oil companies of Kansas had been heard. The oil corporations which had questioned the constitutionality of the tax, were the Sterling Oil & Refining Co., and the Midland Oil & Refining Co., of Wichita, and the Berdy Oil Co., of El Dorado. About $100,000 had been levied against them. These companies contend they own the pipe lines and say the tax amounts to a property tax.

Production And Disposition Of Mexican Crude

TAMPICO, MEXICO, May 25.—Daily average exploited production from Southern district pools in Mexico, and purchases of crude by exporters from field sources, are shown in detail for the week ended May 13, as follows:

Southern District Daily Production by Companies

Company	Amatlan	Tepetate	Toteco-Cerro Azul	Chinampa	Zacamixtle	Potrero Del Llano	Chiconcillo	Totals
El Aguila	6239	550				820		7,609
Agwi	9390			12870				22,260
Continental Mex				186				186
Corona	7153				1634		6999	15,786
Cortez-Atlantica	1761	571						2,332
Huasteca			133000					133,000
International			71537					71,537
Metropolitan	5715							5,715
Mexican Gulf			78236					78,236
The Texas Co				309	406			715
Transcontinental	223			730	111			1,064
Average Week Ended May 13	30481	1121	282773	14095	2151	820	6999	338,440
Average Week Ended May 6.	29845	1197	314297	15606	2333	396	12135	375,809

Daily Average Purchase of Production by Companies

Company	Amatlan	Toteco-Cerro Azul	Chinampa	Zacamixtle	Outside Storage	Totals
El Aguila		28277				28,277
Agwi	1520			135		1,655
Continental Mex	3628					3,628
Corona	363	8394				8,757
Cortez-Atlantica	913	12629	126			13,668
Metropolitan	1954					1,954
The Texas Co	5951	7238		1889	2864	17,942
Tide Mex		37058				37,058
Average week ended May 13	14329	93596	126	2024	2864	112,939
Average week ended May 6.	15187	87683	465	2032	7711	113,078

NOTE—Panuco heavy crude Production averages approximately 125,000 barrels daily, for all interests and purchases are generally distributed.

Notes On Current Petroleum Technology

A review of current contributions in the technical press of this and other countries having to do with the advancement o fthe petroleum industry. Chemists and engineers over the world are working on technical problems connected with oil. Valuable information as to their progress and findings often gets no further than the technical papers. Summaries of the more important of these contributions are offered here the progress of this phase of the oil to allow the layman to keep up with business.—Editor.

New Method of Color Measurement For Oils*

THE results of an extensive investigation of practical methods of color measurement for petroleum oils are described. The work was financed by the Vacuum Oil Co., and was carried out in preparation for a fundamental study of the decolorization of oils. There are at present three recognized methods of measuring the color of petroleum oils, the National Petroleum Association, the Saybolt chromometer, and the Lovibond method. The National Petroleum Association method consists of comparing the oil in a 4-ounce bottle with a set of six or seven arbitrarily chosen colors. In the Saybolt chromometer, a comparison is made through two vertical tubes, matching the color of the unknown oil with that of a colored disk. The Lovibond method consists essentially in comparing the color of a section of the oil (usually 0.25 inch thick) with successive members of a series of colored glasses which have been made to conform to an arbitrary color standard. The comparison is made by adding or taking away glasses until the two squares of color, separated by a wide black partition, appear to match.

While the first two methods are adequate for many trade requirements, they are of little value for accurate measurements or for research work on decolorization problems. The Lovibond method is not satisfactory, because its colors are not additive. For example, a 10 per cent solution of a 400 degree (Lovibond scale) in kerosene does not give a 40 color, but a color about 78. The Lovibond color is not proportional to the amount of coloring matter in the oil.

The new method, to which has been given the designation of True Color, consists in comparing the unknown oil with a standard solution of a heavy oil in kerosene, of about 35 degrees Lovibond color in a Dubosqe colorimeter, a measuring instrument which brings the two fields in close juxtaposition (two semicircles divided by a hair line), and permits the depth of the standard solution in one of the cups to be varied at will and measured accurately. This instrument is equipped with two 50-millimeter cups and one 100 millimeter cup (with glass cover). In addition, there are three film spacers. These spacers make it possible to obtain color readings on the heaviest oils without dilution, and comparing them with the standard solution. They are designated as cells No. 1, 2, and 3, and are used for oils whose true color range is from 120 to 400, 400 to 1100, and 1100 to 4500.

The real value of this method exists in the fact that the standard color is a solution whose type of absorption spectrum is the same as the oils themselves. The depth of color required to match a given glass is dependent to a very marked extent on the sensitivity of the eye of the observer to different colors and to the source of light. Using a standard with the same type of absorption curve, it has been found that neither the observer nor the source of light has any appreciable influence on the readings obtained.

*Contribution from the Research Laboratory of Applied Chemistry, Massachusetts Institute of Technology, by L. W. Parsons and R. E. Wilson; from the Journal of Industrial and Engineering Chemistry, April, 1922.

Investigation Into Physico-Chemical Significance of Flash-Point Temperatures*

Preliminary experiments had shown that for a wide range of organic compounds the following relationship holds good: flash-point=boiling point x a constant, which approximates to 0.74, the temperature being expressed in degrees absolute. In order to extend the scope of the research a form of apparatus much more convenient than the usual testers was devised, low temperatures being produced and controlled by the evaporation of sulphur dioxide and the ignition by electric sparks. For pure liquids the constant mentioned above was then found to be very close to 0.734. For mixtures such as petrol or kerosene a similar figure is obtained if the "boiling point" taken is that registered when the first drop falls from the condenser in an Engler distillation test. In such cases, if the amount of the most volatile fraction be very small, it is clear that variation in the liquid vapor ratio will affect the results. The presence of dissolved permanent gas such as is normally met with in petroleum distillates also introduces a complicating factor.

The relationship holds well for hydrocarbons, but only for the higher alcohols, the lower members showing a steadily increasing divergence with diminishing molecular weight. A few experiments were carried out using oxygen in place of air (when a much lower flash-point was obtained) and under varying pressures. Binary mixtures suitable as motor fuels were investigated, and it was shown that the addition of the more volatile component had a progressively diminishing effect in depressing the flash-point; in certain cases the mixture had a lower flash-point than either of its components.

The paper contains a large number of valuable data concerning flash-points, vapour tensions, and inflammability limits of organic compounds and motor fuels.

*Contribution from the Institution of Petroleum Technolgists, London, by W. R. Armandy and E. C. Craven, from the Journal of the Society of Chemical Industry, January 31, 1922, page 30-R.

Influence of High Temperature on Paraffin Wax*

Influence of high temperature on paraffin wax is a matter of considerable importance to the oil refiner. It is generally agreed that paraffin wax undergoes decomposition or cracking at high temperatures, and that much wax is lost in the straight fire distillation of crude oil. The authors have confirmed these facts in experiments on Galician crude oil. The oil was first treated with 98 per cent sulphuric acid, neutralized with alkali, and washed. The treated oil was then distilled, and the distillation stopped at the following temperatures: 302 degrees F., 392 degrees F., 482 degrees F., and 572 degrees F. The amounts of paraffin wax obtained from the residue were 13.8 per cent from 302 degrees, 12.8 per cent from 392 degrees, 12.2 per cent from 482 degrees, and 10.1 per cent from the residue when the distillation was stopped at 572 degrees F. In each case the wax had a solidifying point of 124 degrees F. Since no appreciable amount of paraffin wax was distilled over, the differences in the amount of wax are attributed to the decomposition of the wax. For this reason, distillation in a vacuum still is recommended. The use of steam in the distillation will also reduce the decomposition of the wax, besides making for better lubricants.

Fuel For Motor Transport†

The provision of an Empire-produced liquid fuel alternative to petrol continues to be of great importance because the consumption of the latter is increasing and the British Empire is responsible for only 2.3 to 3 per cent of the world's production of petroleum. The motor spirit imported into this country amounted to over 207,000,000 gallons in 1920 and to 216,000,000 gallons in the first ten months of 1921. The only methods of producing alcohol which are of proved economic value are those which utilize sugar obtained from the plant or from starch, and the possibility of manufacture on a large scale from materials grown in this country is remote. The following list shows the average yields of alcohol obtainable from the more important raw materials:

Material	Yield of 95% Alcohol Per Ton Gallons
Containing Sugar:	
Mangolds	10
Molasses, beet	64
Molasses, cane	69
Nipa-palm sap	11
Sorghum, sweet	12.5
Sugar-beet	17
Sugar-cane	20
Sugar, raw	139
Sulphite lyes (per 100 gals.)	7-8

*H. Burstyn and W. Jakubowicz: Chemical Abstracts, July 10, 1921, page 2180.

†Memorandum by the Fuel Research Board, Department of Scientific and Industrial Research, London, from the Journal of the Society of Chemical Industry, Jan. 16, 1922, page 13-R.

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NAPHTHA
GAS OILS
PARAFFINE WAX
ASPHALT

Fuel Oil--Lubricating Oils

CYLINDER ENGINE CORDAGE

RED AND PALE PARAFFINE OILS

Material	Yield of 95% Alcohol Per Ton Gallons
Miscellaneous	
Peat	15
Sawdust and wood waste	20
Acetylene	510
Ethylene	475
Containing Other Carbohydrates:	
Artichokes, Jerusalem	19
Barley	72
Cassava	35
Maize	83
Oats	65
Potatoes	20
Potatoes, sweet	35
Rice	88
Rye	77
Sisal	15.5
Sorghum grain	85
Wheat	80
Zamia palm	13

Under the Finance Acts of 1920 and 1921, alcohol to be used for power and industrial purposes is free from all duties except the preferential duty on spirit from foreign countries. In view of the regulations now in force experiments have been carried out to determine the most suitable mixtures of methylated spirits, benzol, and petrol. It is concluded that, to obtain a mixture homogeneous at 0 degrees C., not more than 40 per cent of petrol can be used, the alcohol content may be from 20 to 42 per cent, the benzol varying correspondingly between 40 and 18 per cent. Investigations are proceeding with the object of finding simpler and cheaper denaturants.

Petroleum in Australia*

The chemist to the Western Australian Government, reporting on samples of asphaltum from East Kimberley, and from a locality near the junction of the Ord and Negri rivers, states that the samples are true asphaltum, left by the natural evaporation and weathering of asphaltic petroleum. Prof. Sir Edgeworth David, of Sydney University, states that the discovery at Kimberley is the first recorded occurrence of true mineral oil in Australia and that, although caution is needed, the prospects from a geological point of view appear distinctly encouraging.

Preparation of Viscous Lubricating Oils From Coal Tar**

In 1918 Germany made 50,000 tons of lubricants from the liquors remaining after removing the solids from the anthracene fraction of coal tar. An improved product now available is dehydrogenated and polymerized by means of sulphur. It compares favorably with petroleum oils of the same class (viscosity 4.5 Engler at 50° C.), except where high temperature is a factor.

Purifying Oils†

Hydrocarbon oils such as heavy petroleum distillates are treated with concentrated sulphuric acid. Oil-soluble sulfonated compounds are removed by distilling the oils with fire and steam whereby the sulfonated compounds remain in the still as residues. The distilled oil is again treated with strong sulphuric acid, and then washed with eso-propyl alcohol, which serves to remove the sulfonated compounds

*From the Journal of the Society of Chemical Industry, London, Jan. 31, 1922, page 31-R.

**F. Schreiber: Chemical Abstracts, November, 1921, page 3886.

†E. B. Cobb: U. S. Patent 1,387,835, Aug. 16.

formed in the second treatment with sulphuric acid. Oils thus treated are suitable for medicinal use.

Paraffin Wax: Lubricating Oils*

Paraffin wax and viscous lubricating oils are separated from lignite tar, coal tar, shale tar, etc., by adding acetone or a homolog such as methyl, ethyl, ketone, which precipitates the paraffin wax. A hard wax is separated by cooling to 0 degrees, and a further quantity of softer wax by further cooling to 20 degrees. Lubricating oil is obtained by removing acetone and volatile oils from the residue by treatment with superheated steam at 200-250° or by heating in vacuo. The volatile fractions may be separated by preliminary treatment of the tar with superheated steam. The paraffin wax is refined by dissolving it in a solvent, such as the volatile fractions obtained from the tar, treating with H_2SO_4 and soda lye and precipitating by addition of acetone.

Cracking Oils**

In the distillation of hydrocarbon oils under pressure in a cracking still, fresh stock is introduced into the vapor line leading from the still to the condenser and allowed to flow into the still in counter current to the vapors. This mode of operation serves to increase the yield of light products and the capacity and efficiency of the still.

Chlorohydrins from Petroleum Still Gases and Chlorine†

Chloride and petroleum still gases are passed into an emulsion of carbon tetrachloride or a similar solvent immiscible with water and an aqueous saline extraction medium such as a solution of sodium sulphate or calcium chloride. The chloride and still gas are introduced in approximate equivalent proportions to form chlorohydrins and hydrochloric acid and the oil charged with chlorohydrins is removed from the field of reaction prior to chlorination of the chlorohydrins (to avoid formation of more highly chlorinated products) and the chlorohydrins are recovered from the solution thus obtained.

*E. Erdmann: British Patent 156,604, Jan. 6, 1921.

**E. M. Clark: U. S. Patent 1,388,514, Aug. 23.

†B. T. Brooks: U. S. Patent 1,394,664, Oct. 25.

Specifications Group To Hold Open Meeting

NEW YORK, May 25.—An open meeting of the Interdepartmental Petroleum Specifications Committee will be held July 3 in the auditorium of the Department of the Interior building in Washington, according to announcement made today by the American Petroleum Institute. At this meeting the specifications for petroleum products issued as Technical Paper No. 305 and the testing methods for petroleum products which have been issued as Technical Paper No. 298, both of the Bureau of Mines, will be discussed in detail.

KANSAS CITY, May 25.—O. B. Ward, of the new A. B. C. Oil & Supply Co., is making a trip in connection with his new business among refiners of the Mid-Continent field.

Vogt Products For The Oil Refiners

We manufacture Paraffine Wax Presses, Distillate Chilling Machines, Stills, Auto Truck Tanks, Special Refinery Equipment, Boilers, Refrigerating Machinery, Drop Forged Steel Valves, and Fittings. Bulletins on request.

Henry Vogt Machine Co.
Incorporated
Louisville, - - Ky.

BRANCH OFFICES:
NEW YORK CHICAGO
TULSA DALLAS

PUMPS

Write now telling us about your pumping problems. We will be pleased to make proper recommendations—free of charge.

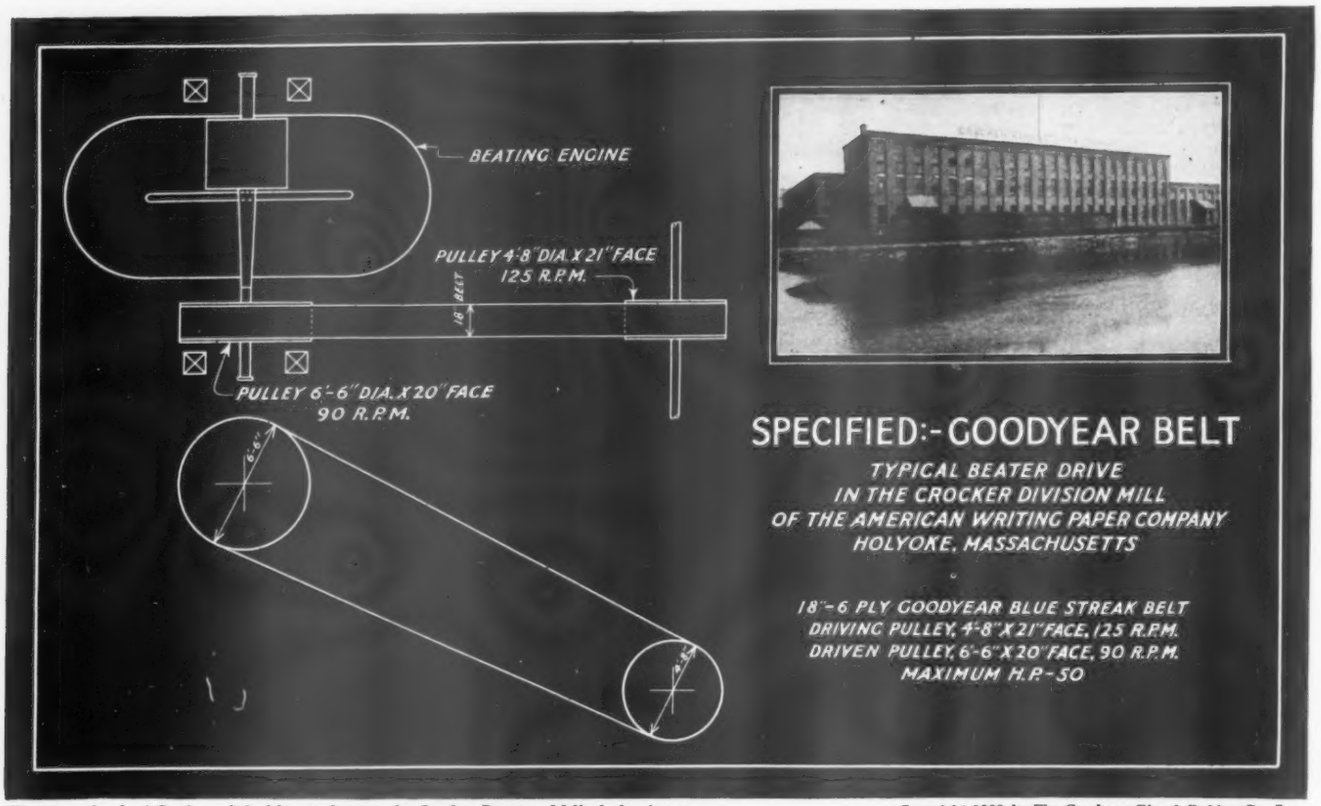
BLACKMER ROTARY PUMP CO.
276 Sheridan Street Petoskey, Mich.

Who
is carrying the load—
you or your trucks?

Pierce-Arrow
TRUCKS

The Pierce-Arrow Motor Car Company
Buffalo, New York

Prices: 2-ton $3200 3½-ton $4350 5-ton $4850 fully equipped


BEATING ENGINE
PULLEY 4'-8" DIA. X 21" FACE
125 R.P.M.
18" BELT
PULLEY 6'-6" DIA. X 20" FACE
90 R.P.M.
SPECIFIED:-GOODYEAR BELT
TYPICAL BEATER DRIVE
IN THE CROCKER DIVISION MILL
OF THE AMERICAN WRITING PAPER COMPANY
HOLYOKE, MASSACHUSETTS
18"-6 PLY GOODYEAR BLUE STREAK BELT
DRIVING PULLEY, 4'-8" X 21" FACE, 125 R.P.M.
DRIVEN PULLEY, 6'-6" X 20" FACE, 90 R.P.M.
MAXIMUM H.P.-50

Blueprint sketch of Goodyear-belted beater drive in the Crocker Division Mill of the American Writing Paper Company, Holyoke, Mass., and insert photograph of the Crocker Division Mill

Copyright 1922, by The Goodyear Tire & Rubber Co., Inc.

Twenty-six Eagle-A Mills and the G. T. M.

The American Writing Paper Company, of Holyoke, Massachusetts, comprises 26 mills throughout the country, making the nationally celebrated Eagle-A Quality-Standards of printing papers. The belting equipment and requirements of their every plant, involving hundreds of drives, have been analyzed in the past two years by a G. T. M.—Goodyear Technical Man.

"This analysis of the belt equipment in each of our 26 plants is the most comprehensive and valuable work of its kind that has ever come to my attention," writes Mr. J. Moles, Chief Engineer of the American Writing Paper Company. "The actual G. T. M. work required months, and the final report, together with recommendations submitted by the Goodyear Company, comprises several volumes."

A great deal of the equipment installed on the basis of this expert analysis is Goodyear Blue Streak Belting. This is particularly true of the equipment of the great beater drives which transmit the power from the main shaft to the great revolving cylinders where numerous knives beat rags into stock for the paper machines.

Two of these Goodyear Blue Streak Belts, 18-inch, 6-ply, were installed in the Crocker Division in Holyoke, in June, 1920. These two Goodyears have been in constant operation for two years now, and have never been touched. They never required taking-up or repairing. Mr. Moles says they are as good today as the day they were installed, though they have been working on this heavy drive for 24 hours a day, six days a week.

Hundreds of other Goodyear Belts in American Writing Paper plants are giving correspondingly faithful, trouble-free and long-wearing service. Their efficient and economical performance is a tribute to the quality built into them and to the correctness and exactness with which they are specified to their jobs.

This is a splendid example of the work of the G. T. M., the working of the Goodyear Plant Analysis Method, and the performance of Goodyear Belts. You can have a similar survey made of your transmission or conveying problem. There is a G. T. M. in your neighborhood, and you may rely on his recommendations and on the quality of Goodyear Belts. For further information about the Goodyear Analysis Plan, write to Goodyear, Akron, Ohio, or Los Angeles, California.

GOODYEAR

La.-Ark. Refineries Unaffected By Haynesville Pool's Decline

Staff Special

SHREVEPORT, LA., May 25

RAPID decline in the production of crude in the Haynesville pool has had no direct effect on the operation of refineries in northern Louisiana or southern Arkansas. No curtailment of refining activities in the territory is anticipated even in case the pool should show a more rapid decline than it has in the past few months.

With one notable exception refineries in the Shreveport district are not running Haynesville crude. The bulk of the oil run is obtained from the El Dorado, Ark., pool. Some is taken from the Homer field and some from the lighter Caddo production.

The one refinery using Haynesville crude mixes it with El Dorado and Homer crudes. The latter two make up about one third of the runs of the refinery. This company uses Haynesville chiefly because it has its own production in that field with suitable connections for transporting it at a minimum cost.

Because of the extremely favorable freight rates to the Gulf port exporters have been active buyers of refined products in the Shreveport territory. They have taken all high gravity gasolines which the north Louisiana and south Arkansas refiners could run. Prices have been substantially better than in other refining centers because exporters have been able to pay higher prices in view of the railroad rates to terminals.

Seek Good Nearby Crudes

With that situation existing refiners have sought those grades of crude near at hand which have given the largest return of high gravity gasoline.

Tests of Haynesville crude by refiners have shown that in the type of plants in the district a gasoline return of only about 22 per cent has been possible. Of that cut the average return of new Navy with a gravity of 58-60 has been only about 8 per cent. Their equipment has not enabled refiners to cut a gasoline with a higher gravity than Navy.

A large part of the El Dorado crude is produced by Independent operators and has been fairly easy by refiners to obtain on contract. Some stiffening in the market is seen at present. This is believed to be an indirect result, to some extent, of the falling off of production in the Haynesville area.

During the latter part of February and even in March El Dorado crude was obtainable at a price lower than posted by Standard companies. It was possible part of the time to purchase El Dorado crude for $1.75 a barrel.

But the last two months have seen the market stiffen greatly. At present some premiums are being demanded in new contracts. While some refiners are obtaining the oil at the market plus pipe line carrying charges, others are paying premiums ranging up to 15 cents a barrel.

Producers Growing Optimistic

A part of the tendency to seek premiums is assigned to the growing optimism producers have regarding the market. Some are looking for an advance in the posted price when they consider the rapid exhaustion of the Haynesville pool which had worried them for months.

But the crude situation cannot be said to be tight. One refiner who is considering opening his plant which has been down for a number of months, was offered a crude contract extending over three years. The contract specified that at no time would a premium of more than 25 cents a barrel be required. As long as such a situation as that exists, Shreveport refiners are not worrying.

Most of the substantial plants in the territory are now running fairly close to their capacity. The smaller plants have been unable to start up in spite of the excellent market conditions which prevail. In the El Dorado district only a third of the plants are in operation running less than 10,000 barrels daily to stills. In the vicinity of Shreveport approximately 18,000 barrels a day are being charged.

Cater to Domestic Trade

A tendency to cater to domestic trade is being seen just now in the refinery market in the territory. Higher gravity gasolines are being largely forsaken and 56-58 gravity material with an endpoint of 450 is being produced to satisfy the jobber demand.

Stocks of all sorts are low. It was estimated by one Shreveport refiner today that there are not more than 60,000 barrels of fuel oil in storage in the territory that is unsold. Virtually no gasoline is in storage. Kerosene has been moved to export with sufficient speed to keep stocks from backing up. Gas oil seems to be the only product that does not move as readily as can be desired by the refiners.

Petroleum Rate War In Southwest Is Foreseen By Traffic Managers

Staff Special

TULSA, May 25.—That a rate war on petroleum products among railroads of the southwest may be precipitated in the near future is expected by a number of the traffic managers of large companies here. The belief arises from recent announcement of intentions to cut rates in this territory.

Telegrams received here this week stated that the Rock Island will follow the lead of the Santa Fe and place Ardmore and other cities in southwestern Oklahoma in Group 3. The Rock Island announcement was to the effect that Ardmore, Waurika, Lawton, Grandfield and other points in that section of the state would be placed on the same footing as the Tulsa territory at an early date.

At the same time announcement was made by the same road that it would establish a 14-cent rate from the El Dorado district on crude and a 12-cent rate on fuel oil destined for southeastern points by way of Memphis. That rate is to be made effective at a date to be announced later. It follows the recent action in making a rate of 14 cents from Shreveport to the southeast by way of Vicksburg and the coastwise rate from Houston to New Orleans and beyond on the same basis.

Traffic managers see a growing desire on the part of the carriers to gain petroleum business, even at the necessity of cutting rates. They would not be averse to seeing such a war declared.

Some opposition to the proposed inclusion of southwestern Oklahoma points in Group 3 is anticipated here. It is thought possible that in addition to protests of other railroads, refiners in the Tulsa-Cushing territory may resent the change as bringing them into closer competition in their sales with southern Oklahoma refineries.

Equalization of Tulsa rates with those in the southwestern part of the state is looked upon, too, as a step towards decreasing the differential between Oklahoma and north Texas plants. That would bring in other competition which has not made itself felt in much of the Group 3 trade territory.

With the exception of the Burbank and Lyons pools notably, the new oil fields opened up recently have been taking a southern trend, it is pointed out by traffic men. If that is followed by a rate equalization trend it might eventually give refineries located farther south an advantage over those in the present Tulsa center. That situation is hypothetical and merely given as a possibility, rather than a probability.

Attack 4.5 Per Cent Raise

WASHINGTON, May 26.— A Pacific coast effort to get rid of the 4.5 cent increase in rates on fuel oil, imposed as a substitute for the 25 per cent increases provided for all freight rates in June, 1918, will probably fail, as did the effort in the east when the Interstate Commerce Commission dismissed the complaint of the Barnett Oil & Gas Co. against the director-general of railroads, six months ago.

Henry C. Keene, an examiner for that body, has recommended dismissal of the East Bay Water Co.'s complaints, two in number, also against the director general, on a holding that the rates charged on fuel oil, from Richmond, Cal., to Alvarado and Oakland, Cal., between August 10, 1918, and March 1, 1920, were not unreasonable. Keene said that, in substance the complaints were the same as the Barnett company. In that complaint the eastern shippers of oil on short hauls tried to get rid of the 4.5 cents per 100 pound specific increase in the rates on oil because it made terrific increases on the short haul rates, such as were involved in the water company's complaints.

Petroleum and Its Products

High Grade—Uniform Quality

Gasoline
Kerosene
Fuel Oil
Naptha
Distillates

Sunshine State Oil & Refining Company
(Incorporated)
Offices, 1019-1025 American National Bank Bldg. Wichita Falls, Texas

Better Petroleum Products

Building your motor oil on Tidioute cylinder stock is like erecting a building on bed-rock formation—both are firm, substantial bases. Tidioute cylinder stock is based on Pennsylvania crude, known nationally for its high "flash point" and resistance to disintegration. It does not clog the lubricating channels; neither does it become resinous during use. You can't afford to risk the good will of your customers. Standardize on Tidioute cylinder stock—it's better!

Tidioute Refining Co., *Tidioute, Penna.*
T. C. HAWKEY

Attention, Blenders!

ARE you protected on your requirements of blending Naphtha for this season?

We can give you any grade from 400 to 500 End Point—spot or contract.

Have you received our latest price list on drum lubricating and grease shipments from our St. Louis plant?

R. J. Brown Petroleum Co.
Boatmen's Bank Building
St. Louis, Mo.

Report Gasoline And Other Stocks Increase

Staff Special

NEW YORK, May 25.—Stocks of refined petroleum produced increased again in April, according to a summary compiled by the American Petroleum Institute from figures sent it by refineries representing approximately 55 per cent of the operating capacity in the United States. The following are the increases in gallons:

Gasoline	12,262,320
Kerosene	4,999,638
Gas & Fuel Oil	6,181,014
Lubricating Oil	1,304,030
Miscellaneous	19,291,818
Total	**44,038,820**

This indicates that on April 30 gasoline stocks were about 857,262,320 gallons, compared with 845,000,000 on March 31.

The supply of oil bought for rerunning decreased 140,850 barrels during the month at the refineries that reported. Figures on the stock of crude oil were omitted in the institute's report because of uncertainty whether the refineries included Mexican oil in their reports.

Pipe line and tank farm stocks of crude oil increased approximately 9,583,000 barrels in April, according to the institute's figures. Increases shown by the major territories follow (figures in barrels):

East of Rockies	7,763,000
California	1,820,000
Total	**9,583,000**

Oklahoma Pipe Line Regulations Upheld

By Special Correspondent

WASHINGTON, May 26.—The Supreme Court of the United States, in a decision in Pierce Oil Corp. vs. Phoenix Refining Co., has held valid, as to future transactions, the Oklahoma statute making common carriers out of all pipe lines which transport oil, with all the heavy burdens of the common law.

The highest tribunal said there could be no doubt about the applicability of the statute to the Pierce corporation's pipe line because that company began operating as a pipe line after the statute became effective. The Pierce company refused to transport oil for the Phoenix, claiming the law of Oklahoma requiring it to do so was unconstitutional as a taking of property without due process of law, in violation of the fourteenth and fifth amendments.

In effect, the supreme court said the Pierce corporation, knowing the law of Oklahoma when it started operation, could not be heard to say that a law enacted before it began operating took its property from it. The court said that "so far as the statute contemplates future pipe lines, there can be no doubt that it is valid." That is to say the Pierce corporation knew the law when it established its pipe line, and, if it believed it to be unjust, it should not have built a pipe line for the state to take away from it.

All Phases Of Advertising Used In Tide Water Publicity Campaign

Staff Special
CLEVELAND, May 25

ONE of the broadest direct to the consumer advertising and sales promotion campaigns conducted by an oil company is that of the Tide Water Oil Sales Corp., the marketing subsidiary of the Tide Water Oil Co., which is now being carried on. The campaign is the largest ever attempted by Tide Water and consists of almost all phases of publicity effort—free press agenting being about the only publicity medium that is missing.

The campaign is nation-wide in pushing Veedol motor oils and greases but for Tydol gasoline it is confined to the middle Atlantic and New England states where this product is marketed, national advertising for it being out of the question. Plans for the 1922 campaign were started as early as March, 1921.

The big effort of Tide Water consists of a series of 13 full page advertisement in two colors in the *Saturday Evening Post,* appearing one every four weeks. These are supplemented by small advertisements in newspapers in dealer territory, one two-columns by 6¼ inches appearing a day or two after the advertisement in the *Post* and another one-column by 6¼ inches appearing a week later. The idea put forth in the *Post* advertisement is carried in the smaller advertisements which also bear the dealer's name and address and for which the dealer pays, the Tide Water furnishing an electrotype or matrix.

Dealer Service Complete

This service to Veedol dealers is complete. Each is furnished every month with a folder of the various advertising matter in loose-leaf form. This, the company explains, has three functions:

1. To keep the dealer informed on the advertising and merchandising efforts.
2. To teach the dealer more efficient and better uses for the advertising material supplied him.
3. To provide current new material which he can put into immediate use.

Three full color pages are also being run in the *Country Gentleman* during the year and five one-half pages. At about the time the advertisements appear in the *Country Gentleman,* eight three-quarter pages are run in a select list of agricultural papers of wide circulation and six three-quarter pages in a number of farm papers of regional circulation. No advertisements are carried in any farm paper in July and August. These two months are the heart of the harvest season and the farmer usually is working from sunrise to sunset and spends his remaining time getting his rest. Tide Water figures it would be money ill spent to try to reach the farmer while he sleeps.

Salesmen Inform Dealers

Tide Water salesmen are trained to teach the Veedol dealer how the nation-wide campaign can be applied directly to his trade and the benefits he can derive from it. Each salesman is supplied with books showing the circulation of each of the media in the territory covered by the dealer. The class of the circulation is also reviewed by the salesman and most of the readers of the periodicals used by Tide Water are automobile, truck or tractor users.

Then there is the auxiliary service furnished the dealer. He is supplied at a nominal cost per hundred with sales letters tied up to the general campaign. The first of these letters tells of the heat and driving force that every automobile motor is under when running.

"Spark! Explosion! Heat! That's the tone your six-cylinder motor hums 200,000 times every hour that you cover 25 miles on the road," says the letter and the motorist is told that heat hits the piston at 1,000 degrees and averages 300 to 400 degrees on the cylinder walls. They are told that such intense heat breaks down the cheaper oils but that Tide Water products are refined to meet this test. The motorist is invited to call at the station of a dealer where there is a chart that will tell him which one of the five different bodied Veedols his particular make of car demands.

Simple Test Outlined

The second letter outlines a simple experiment a motorist may make on his kitchen stove to test the heat resisting qualities of a lubricating oil. This consists of dropping a bit of oil on the stove. If it quickly catches fire and burns, leaving a spot of carbon, it is contended this oil is unfit for use in a motor. It is then pointed out that Veedol when it touches hot moving parts, stays oil and does not burn up.

The dealer also is furnished with a short article for publication in the local newspaper. This discusses lubricating oils but does not mention any brand or company.

Salesmen are provided with letters to be sent dealers with the Veedol advertising service. One of these emphasizes how the campaign helps them to move Veedol off their shelves and urges the use of the accompanying advertising matter at once as a new supply will be brought the next month.

The letters to the consumers are followed with window cards, featuring the current service or advertising thought. In the first folder sent out the chart was featured. Blotters bearing the same message of the window card are sent out by the dealers. Each dealer is provided with 50 blotters free.

Besides the lubrication chart, blotters, letters, window cards, the dealer is furnished with flange Veedol signs which he may attach to his station or garage telling the motorist that Veedol is sold there. Buyers of 500 or more gallons of the oil are furnished with one to two signs 3 by 6 feet which may be placed on the side of the building or along the road that approaches his place of business. There also are muslin signs to be furnished larger purchasers.

Tide Water Sign Board in New York City

Booklets Are Distributed

All buyers are provided with booklets telling facts about lubrication and a tractor book to be distributed in farming territories. A recent advertisement in the *Post* called attention to a booklet of "101 Economies for the Motorist" and is sent to automobile owners upon written request to Tide Water's New York office. The contents of this were described in the May 24 issue of **National Petroleum News, Page 43.**

The main idea set forth in all of the Veedol advertising is that it is a heat resistant. "200,000 Heat Stabs!" is the caption of one and a fiery dagger is aimed at the motor of an automobile. Across the bottom of the advertisement are four pictures showing the process of cleaning a crankcase and filling it with Veedol.

"A Mighty 2-Ton Trust—30 Times a Second," is the heading of another advertisement and the accompanying illustration is a muscular, fiery fist grasping a crank shaft. A recent advertisement asks "Does Your Oil Resist Deadly Heat?" The illustration is a blow torch with its flame aimed at a piston head.

Accompanying this newspaper, magazine and special advertising, directed

You Save by Buying a Taber

Fig. 308 is a powerful pumping unit of two 2-inch 'S' pumps with bronze buckets. Capacity 75 and 100 GPM. Clutches permit independent operation of pumps.

Taber Pump Co.

286 Elm St. Buffalo, N. Y.

Independent Refining Company

Established 1880

For nearly *half a century* our products have stood at the top of all quality products made from that crude of all crudes,

PENNSYLVANIA,

and still we serve.

If your name is not on our books permit us to show you.

Oil City - Pennsylvania

to get our prices and samples of Red Oils made from Pure Pennsylvania and Famous Franklin

It's Never Too Late

Crudes—

Viscosities 225, 300, 350, 400, 500 at 100 Fahrenheit

Shipment in tank cars, barrels or drums

All Products of Petroleum since 1877

FRANKLIN OIL WORKS

General Offices and Works, Franklin, Pennsylvania

by A. W. Sullivan, of the Joseph Richards Co., is a great amount of outdoor advertising being done through the Thomas Cusack Co. These are 10 by 50-foot road signs and Veedol displays are located as follows:

Eastern department—Connecticut, 9; Delaware, 1; Massachusetts, 35; New Jersey, 19; Rhode Island, 5; vicinities of New York City, Albany, Buffalo, Syracuse, Binghamton and Rochester, 42; vicinities of Philadelphia, Scranton, Reading, Pittston, Wilkes-Barre and Pittsburgh, and Baltimore, 34.

Central department—Vicinity of Chicago, 11; Omaha, 4; Detroit, 10; Cleveland, 7, and Columbus, 5.

Western department—Vicinities of Oakland, San Francisco and Los Angeles, 32.

Also there are four in Utah; two in the vicinity of Atlanta, Ga., one near New Orleans, and one near Rye, N. H.

Tydol gasoline road signs are distributed thus: Connecticut, 34; Massachusetts, 61; New Hampshire, 4; New Jersey, 34; New York, 39; Rhode Island, 9, and Pennsylvania, 20.

Until last year all Tide Water outdoor advertising bore the company's colors: orange and black. After making observations, especially of cigarette advertising, it was decided to try other colors and many signs with a blue background have appeared. In New York City there appears the sign shown in the accompanying illustration. Another shows a smiling and happy motorist who says: "Gives my engine new life." And below it appears: "That's Veedol, motor oil and grease."

The same smiling motorist is used in a Tydol road sign. In this he remarks: "Notice that pick up?" Then follows: "That's Tydol, economy gasoline."

Tydol Advertised Separately

Tydol gasoline has been advertised separately in many of the daily newspapers in the East where it is marketed. A strong campaign was conducted during last winter, two points being featured: That the Tydol mixture is 15 parts air to one of gasoline while cheaper gasolines require an 8 to 1 mixture, and Tydol provides "snappy starting in snappy weather."

A special appeal also was made to truck owners in Philadelphia, who were told how they could conserve power and fuel.

During a six weeks' campaign in Pennsylvania and New Jersey newspapers, attention was called to the "Snappy starting in snappy weather" signs which were affixed to all pumps during that period. Recent advertisements have shown graphs of the relative volatility of Tydol and low grade motor fuels and explain how a fuel that volatilized poorly would ruin the oil in the crank case by dilution.

An interesting feature of the campaign is a four-reel motion picture showing Tide Water's activities from production to marketing. Films and projectors are placed in each marketing territory and excellent results are beginning to show from this, according to E. W. Emerson, sales promotion and advertising manager of the sales corporation.

Here And There

TULSA, May 25 A BRANCH office of the Marland Oil companies has been opened at 227-30 Kennedy building here. J. K. Cleary has been placed in charge as office manager. J. R. McGinley, of the Marland Refining Co., will be assistant manager of the office. A private wire has been leased to the general offices at Ponca City.

W. M. Welch, vice president and general manager of the Tidal Refining Co., Tulsa, has been one of the leaders in the development of the natural gasoline industry and in standardizing the product on a stable basis through the Association of Natural Gasoline Manufacturers.

* * *

TULSA, May 29.—John A. Anderson, of John A. Anderson & Co., formerly of Anderson and Gustafson, Inc., stopped in Tulsa for a few days this week to call on the trade. He is on a trip which will take him through Texas, Louisiana and Arkansas before he returns to Chicago.

* * *

TULSA, May 26.—J. H. Campbell, formerly sales manager for the Fairmount Refining Co., has been appointed Tulsa representative of the Industrial Petroleum Corp, of Chicago, a marketing organization.

* * *

TULSA, May 25.—Crop conditions in Oklahoma are reported to be excellent although more sunshine would be desirable according to S. J. Carrier, of the Carrier Oil Co. of Dacoma, Okla.

* * *

BOLLIVAR, N. Y., May 27.—J. M. Barrett, the Bollivar rod wax man, is engaged in cleaning out the Tide Water Pipe Line Co.'s tanks at Bollivar.

* * *

NEW MIDDLETOWN, OHIO, May 25.—Organization of the Ohio-Red River Oil Co. has been completed here for the purpose of drilling on acreage held in Miller county, Ark. Capitalization of the company is $40,000. Officers are: A. W. Craver, President; E. C. Welsh, vice president; A. G. Welshe, secretary and treasurer; and J. L. Marsh, assistant secretary and treasurer. Mr. Craver is a former mayor of Youngstown, Ohio.

* * *

LIMA, OHIO, May 25.—A new filling station has just been opened by the Lilly White Oil Co., of this city, at the corner of Market and Perry streets at Tiffin, according to the announcement of R. K. Clark, advertising manager. The company has recently added fuel and road oils to its list of petroleum products handled. Business of the company is reported to be 40 per cent greater than at the same period last year.

* * *

KENTON, OHIO, May 27.—The C. E. Nash Oil Co. will open a new pressed brick filling station here about June 1. At the same time its bulk station and fleet of tank trucks will be placed in operation. The company will handle Sinclair products.

* * *

HILLSBORO, OHIO, May 26.—A new filling station has just been opened here by Charles L. Carroll, of the company bearing his name. The company has adopted as a trade name for its products, "Karol Gasolines and Oils."

* * *

CHICAGO, May 27.—Robert B. White, formerly in the lubricating oil department of the Taxman Refining Co., resigned effective last Monday to become identified with the Valvoline Oil Co., 108 North Clinton street, Chicago. He is sales manager of the northwestern division.

* * *

CHICAGO, May 26.—Exercising option of purchase made five years ago when the land was leased, the Sinclair Refining Co., last week, bought five Chicago lots on which it is already operating service stations, for $108,735 of J. H. Moon. They have nearly doubled in value since they were first leased.

* * *

CHICAGO, May 27.—Offices of the Carson Petroleum Co., of which C. W. Cahoon is the head, have been undergoing remodeling during the past week. A partition is being removed to get more floor space and accommodate several new employees. The offices are on the eighth floor at 208 South La Salle street.

* * *

CHICAGO, May 25.—Sam Collins, of Ponca City, Okla., vice president and general manager of the Marland Refining Co., arrived in Chicago Saturday morning to spend the week end.

* * *

HOUSTON, May 25. — Houston Hearne of the Bremond Petroleum Co., is spending a few days in Houston, combining business and pleasure. The Bremond company is putting on an extensive "wildcat" compaign near Bremond, where they blocked up thousands of acres.

J. C. Miller, formerly sales manager of the Oklahoma Producing & Refining Co., who recently, with L. T. Kersey, formed the M-K oil Co. for engineering service and the sale of lubricating oils. Headquarters in Tulsa.

* * *

CHARLESTON, W. VA., May 26.—W. I. Agnew, former superintendent of Charleston operations of the Pure Oil Co., has been transferred to the general offices of the company at Columbus, Ohio.

* * *

KANSAS CITY, May 25.—The municipality of Kansas City has awarded to the Standard Oil Co. a contract for 8,000 gallons of gasoline for the use of its water works department, at 18.1 cents.

* * *

NEW YORK, May 25.—P. F. Finnegan, vice president in charge of car service of the Union Tank Car Co., resigned May 20 on account of ill health. B. C. Graves became superintendent, E. C. Sicardi announced.

* * *

APACHE, OKLA., May 26.—Completion of a drive-in filling station at Fletcher, Okla., was announced today by the Lake Waterman Oil Co. The company now operates stations at Apache, Carnegie and Fletcher. The newest station is to be known as the Laeatco station.

* * *

PHILADELPHIA, May 25.—M. R. Gross, who has been treasurer and director of the Union Petroleum Co. of Philadelphia, has been transferred by the Sinclair Consolidated Oil Corp. to the Sinclair Cuba Oil Co. as treasurer. W. Walkinson, who was treasurer of the Cuba company, has been made treasurer of the Union company.

* * *

PHILADELPHIA, May 26.—The importance of durability tests for transformer oil is the subject of a paper to be delivered by Dr. T. G. Delbridge, chief chemist of the Atlantic Refining Co. to be delivered at the annual meeting of the American Society for Testing Materials, to be held at Atlantic City, June 26 to 30.

KEROSENE

With A Place in the World

LORECO

Because it runs tractors instead of motor cars, should kerosene be thought of as a "by-product"? There are more tractors in the United States today than ever before in history! Because it is an economical illuminant and household fuel instead of a means of operation for millions of cars, should kerosene fail to get the benefit of best production methods? There are homes in America by the thousands lighted by lamps and warmed by oil stoves.

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Curtis Style "V"-Stationary Two Stage Automatic Motor Driven Compressor Unit

Fire Department Scores Zero In Oil Plant Fire

The new steel building erected to replace the ruined plant. Put up in 80 days. New office building at right of picture.

Staff Special
CLEVELAND, May 27

DOES your chief of the fire department understand how to fight an oil fire?

Is he familiar with conditions at your plant?

Does he know where the plant fire plugs are? Does he know what other means of fire protection you have, such as steam lines?

These are vital questions. They only come up once in five or 10 years, but when they do come up if that fire chief or the captain of the local engine company does not understand an oil fire, he can cause a great deal of trouble.

For illustration, in January in a large experimental plant that Dr. C. B. Forward has for the Oil Development Co. at Urbana, O., where he has been working on a gasoline process for a number of years and where he had a plant with nearly a half million dollars invested, a fuel oil line sprung a leak and ran down to the fire box.

A fair-sized blaze was in progress when the watchman discovered it. The frame building above was on fire. Instead of using the fire hose which hung nearby, the watchman tried to put it out with small hand extinguishers. In the meantime the fire department was called. A couple of freight trains blocked the road to the plant. When the firemen got by the railroad crossing a good part of the plant was in flames. The fire chief got quite excited and put in considerable time calling to the crowd to stand back that there was liable to be a terrific explosion any minute, whereas there was no chance in the world for an explosion.

He turned his fire hose on the first thing handy, which happened to be a couple of small fuel oil tanks.

He filled those tanks with water and slopped the burning oil all over the place, next he directed the hose at the asbestos insulation on some steam lines. When Mrs. Forward arrived, Dr. Forward being out of town, she tried to tell the fire chief to save the office building, which was just starting to burn, and let the non-burnable stuff go. After some argument she convinced him that she was the wife of the head of the outfit and knew something about the business, so the fire chief turned the hose on the office building.

That was pretty well gone by then, but the steel safe cabinet stood upright on what remained of the floor. It was red hot, the doors were beginning to bulge a bit, so the fire chief threw a heavy stream of ice cold water on them. The doors promptly flew open and the water washed the burning papers all over the place. The result was that all the records in the safe cabinet were destroyed. Some open records lying on a shelf near by were just singed, but they were not the important records of the plant, unfortunately.

It's the opinion of Dr. Forward that if the fire had been properly fought from the start, the flames would not have amounted to anything. Even if the firemen had used good judgment when they first came up, a good bit of the plant could have been easily saved.

In three days Dr. Forward had placed an order for a new steel building which was erected in 80 days. He has put up a new office building, overhauled all his equipment and expects to have the plant running in June, when he will make the demonstrations that he had promised for this spring.

Many fire chiefs understand fighting a fire in an oil plant, but probably the majority of them do not. It would be well if every oil man saw that his fire chief or the captain of the nearest engine company understood the proposition.

In the larger cities or where there are any number of oil plants, the fire department is generally well qualified to handle an oil fire, but where they haven't the experience it would be well to coach them. Of course, the chief thing to have them avoid is throwing water into a burning tank and flooding the contents of that tank all over the place.

Interior of the office building after the fire—and the firemen had done their worst.

Buys Jobbing Plant

CLOVIS, N. M., May 25.—William Grady Head, of Roswell, N. M., has purchased the Triangle Oil Co. here. This co-partnership which was owned by J. E. Lindley, an automobile agent, John Barry, a hardware merchant, and S. A. Jones, of the Citizens Bank of Clovis, has a modern wholesale station with 60,000-gallon storage capacity, steel barrels, delivery cans and trucks as well as a new warehouse for lubricating oils and greases. Mr. Head will take active charge June 1. He relinquished the agency for The Texas Co. at Roswell May 15 after having served since 1911.

Did someone lend you this issue? See page 47.

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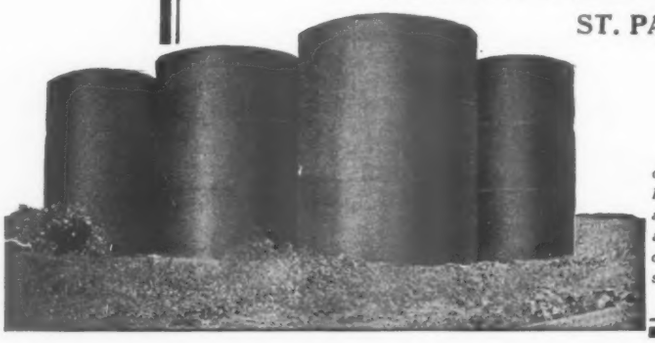

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Petroleum Colorimetry; Its Importance And Summary Of Methods

By Paul D. Barton

Mr. Barton is a graduate of Oklahoma University and the California Institute of Technology. For more than two years he has been with the Lubricating oil research department of the General Petroleum Corp. at the Vernon (Cal.) refinery. His paper on colorimetry is published by courtesy of the American Chemical Society and was read at the meeting of the Southern California Section at Los Angeles, Sept. 29, 1921. The impulse behind this summary of petroleum colorimetry, Mr. Barton explains, is to convey to those uninterested in the judging of the quality of petroleum products what they may expect to see and how to interpret it. —Editor.

LOS ANGELES, May 25

THE IMPORTANCE of petroleum colorimetry lies in the fact that the appearance of a finished product is the first standard of value to a large majority of consumers. This is entirely logical, as it is an actual fact that, in general, degree of refinment is indicated by the relative lightness of color of the product.

It is very often the case, however, that of two similar oils the darker one is, on the whole, the better. This is particularly true in the case of lubricating oils. But of two oils whose "history" is not known to the buyer, the preference should always be given to the most attractive appearing one. This hardly need be said, however, because most consumers do so anyway. In the case of those who know nothing about how oils are refined, it is nothing more or less than plain human nature. And in the case of those who do know something of the methods of lubricating oil refining, the human nature is combined with logic. For it is general practice to continue the acid treatment or the filtration until a certain color is obtained.

Because of this association of color and value, one of the first requisites of a colorimeter scale is that the colors designated shall be possible of mental visualization. That is, the color nomenclature must not be obscure.

Important Colorimetric Methods

There are three distinct colorimeters used by the petroleum industry in this country. They are: the Lovibond tintometer, which is used for all classes of products; the Saybolt universal chromometer, used exclusively for very light colored products such as gasoline, kerosene, and paraffin wax; and the Union petroleum colorimeter, which has been adopted by the National Petroleum Association for taking the color of all classes of lubricating oil.

The Lovibond tintometer is by far the most desirable instrument for very accurate color matching and recording. It is so flexible that practically all shades and colors of both liquids and solids may be exactly matched, and the recorded color description may be reproduced by anyone having access to a complete tintometer set.

The tintometer consists of, besides the instrument itself, a set of standard glass color slips and a number of metal cells for holding the liquid to be examined. These cells have clear glass ends and vary in length from 1/16 inch to 18 inches, so that any desired depth of liquid may be taken for the color determination. The Lovibond system of color measurement is so thorough that I believe a more or less complete description of it will not be out of place here.

Standard Scales Determined

In the Lovibond system, standard scales for the three dominant colors red, blue, and yellow—have been worked out. Each individual scale (for instance the red scale) consists of glass slips all of the one color (the pure spectrum color) but differing in depth or intensity, the divisions of difference being equal and additive throughout.

The color units are not only equal throughout each individual scale, but also have a color equivalence between the different scales; that is a given number of units in one scale have an equivalence in color value to the same number of units in each of the other two scales. When equal units of any two, or of all three, are superimposed, a complete color series is founded, consisting of red, orange, yellow, green, blue, violet, light, and black or neutral-tint.

The equivalence of color is shown by the fact that a ray of normal white light can be gradually absorbed to extinction without the development of any color, by successive additions of an equal number of units of the red, yellow, and blue standards. The luminous intensity (not color intensity) of a light ray whose color components have been so absorbed, is then represented by the number of units of neutral-tint required for this total absorption. The combined absorptive effect of these three scales is called neutral-tint. The neutral-tint unit is the quantity of normal white light absorbed by one red, one yellow, and one blue, glass standard unit combined.

Composing Other Colors

The other three colors, orange, green and violet, have their units formed by the addition of one unit each of the two component primary colors. Thus, one unit of orange is made up of one unit each of red and yellow; one unit green, of one unit each of yellow and blue; and one unit of violet, of one unit each of blue and red. The color equivalence of these secondary colors is the same as that of the primary ones.

In order to eliminate some of the tediousness involved in matching color of a petroleum product with the primary component colors, a special set of Lovibond color slips has been developed for the use of the petroleum industry. The color is a definite amber shade, made up of a certain proportion of red and yellow. This amber scale has the same size units as the other scales and only the one color is used. By increasing the number of units of this one composite color, any shade from a very light yellow to a deep red-orange can be matched fairly closely. In recording the color of an oil in this system, two things must be stated; 1.—The length of the cell used, and, 2.—the number of amber units required to match the shade. This fact, together with the unwieldiness of the instrument itself, makes the Lovibond system very impractical.

Matching Made Difficult

First, it is safe to say that no two oils from different sources will show the same proportion of red and yellow on a color analysis, and probably neither will have the same proportion as that of the amber standard. Moreover, many oils have a blue element which makes the matching with an amber standard very difficult, visually speaking.

Second, there is no standard length of cell used by all observers, and as the intensity of the color shade is by no means directly proportional to the depth of the liquid, this variable factor (even if the depth used is always specified) makes extremely difficult the mental visualization of the color shade.

Third, because of the small size of the unit employed, many numbers are necessary to designate all the shades in the petroleum color-range. For instance, in passing from a pale yellow to a deep red-orange, the corresponding Lovibond amber numbers increase from 1 to about 350 or 400 when a 1 inch cell is used. This complicity of the Lovibond color nomenclature very greatly increases the difficulty of mental visualization mentioned above.

The undesirable features of the Lovibond tintometer are avoided to some extent in both of the other types of colorimeters.

Saybolt Colorimeter

The Saybolt instrument consists of two upright glass cylinders about 20 inches long, one graduated. The latter is filled with the oil to be examined. Two light-amber glass discs, exactly alike, are used, only one disc being placed at the bottom of the empty glass cylinder when very light colors are to be matched, both discs being used for the deeper shades. An eyepiece at the top of the cylinders is so arranged that the image appears as two halves of a circle, the tint of one-half being that of the standard, while the tint of the other is that of the column of oil. Unless the oil is lighter than what is termed "water-white," the color of the full column will be darker than the standard, and the adjustment is made by slowly drawing off the oil from a small faucet in the bottom of the graduated cylinder until a match is obtained. The color of the oil is then expressed by the height of the column in arbitrary scale divisions, ranging from 0 to 25, the higher the number the lighter the color.

As mentioned before, the Saybolt instrument is used only for very light colored products. Unlike the Lovibond system, this colorimeter is entirely empirical, the scale divisions are not regular, and the individual color-

shades have a meaning only by virtue of definition.

However, the Saybolt numbers always have the same meaning. They are fairly easily associated with the common standard terms "water-white," "prime white," "standard white," and so forth. Moreover, the instrument is compact and simple to use. The disadvantages are: 1.—the empirical nature of the system; 2.—the narrow range of color-shades, and 3.—the fixed color composition of the standard, which makes it very difficult to determine the color of some products. This is especially noticeable with certain gasolines and motor fuels made by cracking processes. Often products of this kind may possess a saleable "water-white" color in a bottle, but when viewed in a Saybolt chromometer they are seen to have a brownish tinge which it is impossible to match with the standard. Such a condition may lead to contract difficulties when Saybolt colors are specified.

The Union Petroleum colorimeter for lubricating oils is the simplest of the three. It consists of a narrow box, slightly tapering and about 18 inches long. The smaller end has a half-inch round opening or "peep-hole"; the other end is a piece of white glass which furnishes a white background for the observation. Two round holes are cut in the top near the end away from the observer. There is also a slot in front of the left-hand hole. The oil to be examined is placed in a standard four-ounce glass oil-sample bottle which is then inserted in the right-hand hole. A similar bottle filled with distilled water is placed in the left hole and the standard color slides are inserted in the slot in front of the "water-white" bottle. The instrument is then taken to a window and the color of the oil compared to that of the standard color slides. The number of the slide which most nearly matches the oil is recorded as the color.

Eleven Colors Used

The National Petroleum Association standard colors as used in the Union colorimeter, are eleven in number, and are known as the N. P. A. colors. There are also three additional slides intended for the examination of cylinder oils but they have not come into very general use. Each color is designated by a letter, a name, and a number, but the numbers alone are used almost exclusively. The color-range from light yellow to deep red is divided arbitrarily into seven wide steps. These steps are numbered, beginning with the lightest, 1, 2, 3, 4, 5, 6, and 7. Besides these main steps, slides are given for the half-steps from 1 to 5.

Unlike the Lovibond amber petroleum scale and the Saybolt chromometer scale, the N. P. A. colors are not simply a one definite color shade varied in depth. Each and every N. P. A. color has its own proportion of red and yellow (and blue in the case of 4, 4½, 6, and 7) which is different from that of any of the other colors. This is probably traceable to the way in which these colors originated. Each has the exact Lovibond component color-composition of a member of a series of representative lubricating oils arbitrarily chosen by the Union Petroleum Co., and the N. P. A. standard color slides are made up of the Lovibond slips required for the exact matching. The result is a scale of colors with no very direct relationship between the individual members.

In spite of the empirical nature of the N. P. A. color scale, it has more desirable qualities than the Lovibond. First, the instrument is simple and compact and is easily moved to the best light. Second, its colors almost exactly match many lubricating oils. Third, it gives the color of the oil in a standard four-ounce glass oil-sample bottle, a bottle of definitely specified size which is universally used in this country for exhibiting samples of all kinds of petroleum products. Fourth, mental visualization of the color is distinctly aided by the small number of standard slides, seven whole steps; the designation of these few colors by simple integral numbers; and the color recorded being that of the oil in the four-ounce bottle, familiar to all oil men. All of these are very distinct advantages.

The disadvantage of inaccuracy arising from the wide steps between the colors and the fixed color shades of the standards, are possible of elimination to some extent; first, by the simple subdivision of the scale into tenth steps (or even twentieth steps where the perceptible differences will warrant) the fractional steps being obtainable by the use of a few additional Lovibond color-slips; and second, by the observer developing the habit of judging the comparison in terms of color intensity or depth rather than color-shade.

The chief factors which introduce error into colorimeter readings, are; luminosity of the color of the oil; time of observation; varying source of light; reflected color rays in the light; perceptible differences, and fluorescence or "outer-tone" of the oil.

Factors Influencing Readings

Some oils seem to possess the faculty of transmitting much more light than others. While they apparently have the same depth of color, one may be distinctly "brighter" than the other. By passing the hand between the colorimeter and the source of light, the eye can often catch the difference in color intensity of the oils which were apparenly matched before. The brighter oil will quite often possess the deeper shade of the two. An exact color-analysis of the oils will show the reason for this. It will probably be found that the red component is present in very nearly equal proportions, but that the brighter oil will possess considerably more of the yellow component than the other oil.

Colorimeter readings must be made quickly. The ability of the eye to distinguish differences in color shades decreases rapidly with the time of observation. Visual fatigue for various color-rays takes place at different rates, composite colors thus gradually changing in appearance. The effect is so marked that the general rule has been established that the time of observation for colorimeter readings should not exceed five seconds.

Pure White Light Best

Pure diffused white light is always desirable for accurate colorimeter readings. Readings taken early or late in the day often vary considerably from those taken at midday. In discussing this question, Mr. Lovibond, in his "Light and Color Theories," points out that "not all lights which appear white to the vision are truly normal white; color may be masked by excess of luminosity . . . . . Direct sunlight, and some artificial lights, are instances. On the other hand, an abnormal light may be too low for the vision to discriminate color. This may be observed in nature by the gradual loss of color in flowers, etc., in the waning intensities of evening light."

Another disturbing influence is the presence of colored rays in the light. These colored rays are reflected from nearby objects such as buildings and trees. Aside from these reflected rays, Mr. Lovibond mentions what he terms a "residue red ray" which is present in sunlight and most artificial lights, and which passes through color-screens unabsorbed.

The effect of the magnitude of the perceptible differences in colors is felt in two different directions. First, all observers do not possess the power of color intensity differentiation to the same degree. Thus in making comparisons between the N. P. A. scale and the Lovibond amber scale, one company has found that commencing with N. P. A. color No. 2, that different observers vary as much as 6 per cent either way, making a maximum difference of 12% calculated on the Lovibond color intensity. Second, outside of the visual short-comings of the observers themselves, the magnitude of the smallest perceptible differences in the various color-shades increases remarkably fast as we pass from predominantly yellow shades to those predominantly red.

Fluorescence of the Oil

I wish to mention one other factor which is closely connected to the color of lubricating oils and which has a very marked effect on the apparent color of bottled samples, and a consequent bearing on the saleability of the product itself. This is the fluorescence of the oil, known to the trade as "outer-tone" or "bloom." This property is not shown up at all by transmitted light and so does not enter directly into ordinary colorimetry. The illusion is so strong in some instances that two oils of the same colorimeter color, one possessing a light yellowish-green fluorescence and the other a deep blue tone, if viewed by reflected light will appear to fall about two N. P. A. color shades apart. Any casual observer would say that the oil with the green "outer-tone" is much lighter in color than the other.

NEW YORK, May 26.—The Eighth National Exposition of Chemical Industries will be held in the Grand Central Palace, New York City, Sept. 11-16 inclusive. It will follow immediately upon the fall meeting of the American Chemical Society. "Raw Materials, Machinery, Products" is the way the exposition is described and it is intended to carry this main impression. The raw materials are exhibits of the natural resources from out of the earth and above the earth. The machinery exhibits consist of apparatus and equipment and instruments for control, precision, recording, gauging, measuring, and machinery for every mechanical operation in the manufacture of products from the raw materials.

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Company Formed To Operate Gasoline Plant

TULSA, May 25.—For the purpose of building and operating a gasoline plant in the Burbank field, Osage county, the Romarti Gasoline Co. has been organized with a capital of $450,000. Three large producing companies operating in that field have organized this company so that their casinghead gas may be utilized economically and so that each will not have to erect and maintain its own individual plant. These companies are the Roxana Petroleum Corp., Marland Refining Co. and Tidal Refining Co., part of the name of each company being used in the name of the new corporation. All of the stock of the Romarti company will be owned by the three companies mentioned.

Officials of the new company are: T. F. Lydon, of the Roxana Petroleum Corp., president and treasurer; W. M. Welch, of the Tidal Refining Co., vice-president; P. R. Chenoweth, secretary and W. H. Roschke, assistant treasurer, both of the Roxana. W. G. Lackey, of the Marland Refining Co., is a director, as is W. M. Welch.

Active management of the company will be in the hands of a committee composed of S. C. Carney, of the Roxana, R. R. Owens, of the Marland, and L. F. Bayer, of the Tidal companies. The Plant of this company was fully described in the May 3 issue of **National Petroleum News**.

British Technologists Publish Lecture Series

LONDON, May 26.—"The Petroleum Industry," put out under the auspices of the British Institution of Petroleum Technologists, is just off the press. The book is described as a brief survey of the technology of petroleum, based upon a course of lectures delivered by members of the institution at the petroleum exposition at the Crystal Palace, London, in 1920.

The book has an introductory by Sir Frederick W. Black and a resume of the lecture delivered by the late Sir Boverton Redwood before the Royal Institution of Great Britain in 1918 on "The Romance of Petroleum." The book is dedicated as a memorial to Sir Boverton.

Following the lecture on "The Romance of Petroleum," which treats of the development of the oil industry in a general way, the lecture headings are:

Wildcatting, by E. H. Cunningham-Craig: Oil Prospecting, by George Howell; The Winning of Oil, treating of oil field practice from the selection of plant to the production of oil; Oil Transport, Storage and Distribution, by H. Barringer; Petroleum Refining, by A. E. Dunstan, secretary of the institution; The Chemical Nature of Petroleum, by F. B. Thole; The Uses of Petroleum Gases, Petrol and Paraffin, by W. R. Ormandy; The Uses of Heavy Oils, by J. S. S. Brame. There is an article on nomenclature by J. Kewley in which many useful definitions of terms used in the industry are given and a chapter of statistics by A. W. Eastlake, giving production of crude by years for various countries, conversion tables from specific to Baume gravity and similar information. There is also a selection of petroleum text books compiled by W. H. Dalton.

R

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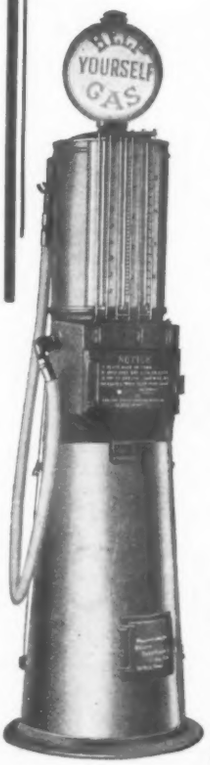

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Production, Consumption Both Fall

THE figures issued by the U. S. Geological Survey for April covering crude oil production for that month, are about in line with current conditions, according to the week-to-week estimates. April was a month of declining production for the country generally, for imports and for deliveries of crude oil to refineries by pipe lines.

The Survey credited Oklahoma with a daily production slightly more than 400,000 barrels daily. The weekly estimates do not run quite that high, but the monthly summaries have uniformly shown the crude output to be a little higher than have the weekly figures. The discrepancy, however, is not great enough to make much difference.

Stocks Again Show Big Gain

The daily average deliveries of crude fell so far off during April that at the time production was slipping for the first time since October, the accretion to stocks east of California was nearly nine million barrels. This does not include gains in stocks of Mexican oil. The gain in stored crude was so great that at the rate of April consumption, there was 172 days' supply on hand, including the Mexican storage in this country. Exclusive of California and Mexican stocks, domestic crude held on the last day of April would last more than 160 days at the April rate of delivery.

Pioneer Pool Gets Big Pay

A completion in the Pioneer pool of Eastland county, Texas, rated at 12,000 barrels, drew additional attention to this area which on May 24 has 23 producing wells making a combined daily average of 11,000 barrels. The new well was 16 feet in lime found at 2,435 feet. Prairie Pipe Line Co. is now building a 6-inch line from its Ranger facilities to this pool supplementing its 4-inch line which had been serving the pool. About 70 wells drilling, rigs up and wells in various stages of completion shut down were reported at the last of the week.

Bristow Holds Interest In Oklahoma

The town of Bristow in Creek county, Oklahoma, is now enjoying a full-fledged oil boom, due to the completion of the sensational well in that territory three weeks ago and which at the end of last week was making around 10,000 barrels. Another well in this vicinity, three miles north of the big producer, was flowing by heads at the end of the week, and was rated as good for about 1000 barrels.

The Burbank pool last week averaged 69,000 barrels daily, its highest mark so far. The Lyons pool, which has been waning, lost 12,000 barrels in daily averages over the preceding week and averaged 22,500 barrels.

Orange Crude Advanced 25 Cents

On May 25, an advance of 25 cents was posted on the price of crude in the Orange field of the Gulf Coast. This brought it to the $1.25 level of other Coastal crudes and had only local significance.

Development in North Louisiana was retarded by the damage done by the wind storms at the first of last week. Some 300 derricks were blown down.

Rush Development on Teapot Dome

In Wyoming, the Mammoth Oil Co., or Sinclair interests, are preparing to drill 20 tests required by its contract with the government on the Teapot structure south of Salt Creek. A temporary camp has been set up and trucks are now hauling material from Casper. Indications are the 20 tests, constituting the first series of wells called for, will be started practically simultaneously.

Orange Price Raised To Coast Crude Level

Staff Special

HOUSTON, May 26.—Humble Oil & Refining Co.'s 25 cents a barrel advance, posted May 25 for Orange crude, was merely the placing of oil from this pool on a parity with other Gulf Coastal grades. Orange (Cow Bayou) crude formerly had been posted at $1 as compared with $1.25 for other lubricant grades in the South Texas region.

On the northwest flank of the Hull salt dome, in Liberty county, where the Yount-Lee Oil Co., recently brought in its No. 1 Stengler, a second producing oil well has been completed by the same interests. The second well is No. 1 Merchant, rated good for 8000 barrels, maximum daily production. The two wells made 13,653 barrels, combined production, May 24. Higgins Oil & Fuel Co.'s No. 1 Merchant, on the same flank of the dome and which came in as a "wild" gasser a week ago, has been controlled.

No. 1 Stengler, which is 300 feet east of the Merchant tract completion, has totalled more than 150,000 barrels production in the first thirty days of its life.

Newspaper reports of a "gusher" well said to have been completed in the Vinton, La., pool, by Marrs McLean and associates of Beaumont, early in the week proved incorrect. The well came in for an estimated flow of about 15 million cubic feet of dry gas around 4100 feet.

Other operations in Gulf Coastal territory were of nominal interest only.

In the Currie-Wortham pool of Navarro county, 14 miles northeast of Mexia development, the J. K. Hughes interests completed No. 1 McGaw for initial production of 1450 barrels daily at total depth of 3308 feet. It is a quarter of a mile due south of the Humphreys-Texas Co.'s Cole well, brought in some time ago. Nearly a mile southwest is the Snowden Brothers & McSweeney gasser on the D. E. Blanchard tract, which last week developed a flow of 300 barrels of oil daily.

Roxana Petroleum Corp.'s No. 4 Scott in the South Bend section of Young county, where black lime production underlies the lenticular sand producing horizons, came in making 100 barrels an hour at total depth of 3523 feet. The drill topped the lime at 3515 feet and was drilled one foot into the pay encountered at 3522 feet. Roxana's No. 1 Wittenberg test, in the same general territory, is spraying oil at 3590 feet.

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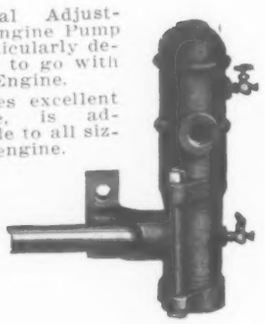

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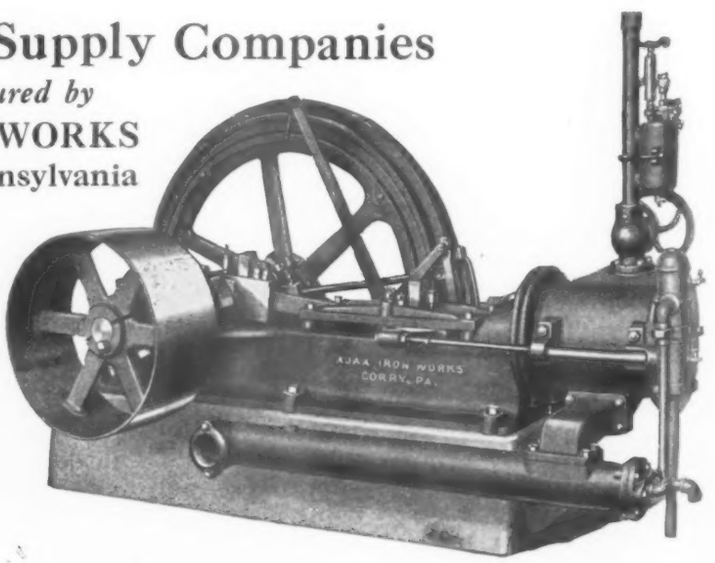

Oklahoma Production Again Increases
Bristow Field Holds Attention

Staff Special
TULSA, May 27

Oklahoma's production got back into its stride during the week just past, and once more shows a substantial increase, the state's output now being approximately 392,500 barrels daily, as compared with 390,200 barrels last week. Burbank came back after a brief slump, as had been predicted, and is now at the highest point in its brief career so far, with a daily production of 69,000 barrels. This production is coming from 316 wells, of which 13 were completed during the past week, and this string of new wells served to bolster up the field's output materially.

The Lyons pool continued to decline rapidly, its production now being down around 22,500 barrels daily, a loss during the week of nearly 12,000 barrels. In three weeks this field's daily production has fallen from 48,000 barrels to its present figure. Salt water is fast taking possession of the field, affecting not only wells which have been producing for some time but recent completions as well, most of which now report varying amounts of salt water along with the oil after having been drilled in.

Completions throughout the state during the past week show a substantial increase over last week's figures, although this increase is probably due more to improved weather conditions than to more intensive drilling. During the week just closed there were 121 completions, of which 86 were oil wells, 20 gas wells and 15 were dry. During the preceding week there were but 86 completions, of which 49 were oil wells, 11 were gas wells and 26 were dry.

The weather has been so unsettled all spring that operations in the fields have been more or less hampered at all times, but severe storms last week served to tie the fields up pretty generally for several days. Conditions are considerably better just now, and this is reflected by the larger number of completions reported.

After all the excitement caused last week by the Roland Oil Co.'s big well near Bristow, this week has been rather devoid of features. The Roland well, however, is feature enough to last for some time, and is still the center of interest locally, along with the development in its vicinity. The Roland well, now conceded to be the largest producer ever drilled in Oklahoma, has declined considerably in production, as was to be expected, but is still making 10,900 barrels daily, and has probably enriched its owners to the extent of at least 150,000 barrels of oil since it was brought in. The company now has rigs up for two more tests on the same 80-acre farm with the big well, described as the W½ of the SW¼ of 2-15-8, these wells to be numbered 2 and 3, respectively. The Carter Oil Co. also has a rig up for its No. 2 on the Catt farm, in the W½ of the NW¼ of 2, where it recently completed No. 1 in the northeast corner of the lease, now making 2500 barrels daily.

Bristow Center of Boom

Bristow is having a real oil boom, with conditions similar to those obtaining in all such towns when hit by oil excitement. Bristow has been the center of considerable development for some time, and thus is by no means unacquainted with oil men and their ways, but the Roland well caused a greater influx of people than all the other operations in the vicinity combined, and Bristow residents are profiting greatly thereby. The Frisco railroad put on additional equipment to handle its greatly increased business between Tulsa and Bristow, and it has been liberally patronized. Five trains each way a day between the two cities are now available to the traveling public, and this has been a great help to the oil fraternity, as it has been almost impossible recently to secure sleeping accommodations in Bristow. A great number of sightseers and excursionists have made the pilgrimage to the Roland well, although there hasn't been much to see except when the well was running wild for a short time last week.

The Roland Oil Co. has made another bid for prominence in the oil world and added further to the interest with which its operations are being watched, by drilling in a wildcat well three miles from production in the territory lying between its record-breaking well near Bristow and the development of the Red Bank Oil Co. and others on the Catfish anticline. This well is located in the southwest corner of the NE¼ of 23-16-8, and is about two and a half miles west and a mile north of Bristow, and three miles north of the company's well in 2-15-8. They got the top of the pay at 3150 feet, and at a few inches in the well began making quantities of gas. After having been drilled four feet into the pay the well began flowing by heads, but no estimate of its production has been made, as the oil has been going into an earthen reservoir on account of lack of tankage.

This may make a good well upon completion, and makes the Bristow territory look better than ever. It is at about the same depth at which the company's big well, No. 1 Alex, got the sand, which was at 3142 feet, and the large amount of gas encountered in the top of the sand also is similar to conditions obtaining in the Alex well before it was drilled in. The latter had been drilled but two feet into the sand, however, when it started its great production, and has not been deepened since, although it has probably drilled itself in considerably. The Roland's new well in 16-8 is evidently not in the same sand in which the Red Bank Oil Co. has gotten several good wells recently, as its No. 1 Newblock in Sec. 9, got the big pay at 3528 feet, where it had an initial production of 1350 barrels. This is about three and one-half miles northwest of the Roland well.

Showing in Love County

An interesting item of the week's developments was the news that an oil showing had been picked up in Love county, in the extreme southern edge of the state, indicating that this county's first oil production may soon be developed. The well in which this showing was had is the Union Petroleum & Supply Co.'s No. 1 Draughon, located in the northwest corner of the SW¼ of the SW¼ of 27-6S-2E, between Marietta, Love county and Ardmore, Carter county. This is about six miles southeast of the Brock field in Carter county, discovered by the Amerada Petroleum Corp. The Love county test

Oklahoma and Kansas Estimated Daily Average Production

	May 27	May 20
Cushing District	25,000	25,000
Healdton	20,000	19,500
Hewitt	29,000	29,000
Burbank	69,000	64,500
Lyons	22,500	34,200
Oklahoma, general	227,000	218,000
Kansas	82,000	82,000
Total	474,500	472,200
Increase		2,300

Completions in Oklahoma for Week Ended May 27, 1922

OKLAHOMA

Company	Well No.	Location	Depth	Initial Prod.	Shot
Caddo County					
Magnolia Pet. Co.	1	SE SW 25-6-10w	2298-2318 OWD	3	
Waldo Oil & Gas Co.	4	SE SE 11-5-9w	2309-2324	125	
Carter County					
Carter Oil Co.	8	SW NW 15-4-2	1822-1955	65	
Humble Oil Co.	11	NE SW 9-4-2	1905-2015	75	
Humble Oil Co.	12	NE SW 9-4-2	1914-1977	75	
Humble Oil Co.	1	NW SE 16-4-2	2242-2295 OWD	60	
Carter Oil Co.	24	SE NE 21-4-2	2202-2251 OWD	50	
Texas Co.	6	SW SE 21-4-2	2320-2360	140	
Owl Oil Co.	4	NW NW 6-2s-4w	T. D. 942	Dry	
Comanche County					
J. A. Harper	1	SWc NE 11-1n-12w	T. D. 1250	Dry	
Choctaw County					
Gillam and Foster	1	NW NE 13-5s-14w	T. D. 2503	Dry	
Creek County					
Emery & Sons	4	NE NW 2-14-8	2465-2497	40	120
Billingslea et al	3	SEc NW 27-14-8	2430-2465	50	120
Texas Co.	1	SE SW 13-16-9	2768-2773	480	
The Reliance Oil Co.	17	NWc SE 9-17-12	2290-2303	100	5
Wilcox Oil & Gas Co.	8	NW SE 13-16-9	2760-2769	490	
T. B. Slick	1	SEc 15-16-9	3016-3031	20	60
Rolland Oil Co.	2	SEc NE 18-16-9	2662-2682	35	
Emery & Sons	1	SW NE 21-16-9	2922-2932	20	40
Texas Co.	3	NE SE 21-16-9	2913-2920	40 hour	
Waite Phillips	1	SE NE 22-16-9	2976-2995	30 hour	
Sartin & Phillips	4	NE SW 22-16-9	2938-2946	17 hour	
Atlantic Pet. Corp.	5	SE SW 22-16-9	2925-2955	1550	
Twin States Oil Co.	4	SW SE 22-16-9	2894-2949	25 hour	
Continental Pet. Co.	13	SW SW 27-16-9	2868-2894	20	
Continental Pet. Co.	4	NWc NE 27-16-9	2966-2986	325	

(Table continued on next page)

has drilled through two shows of oil, and has had besides four gas showings, but has passed them all up temporarily and is drilling deeper, and is now underreaming the ten-inch casing at a total depth of 1350 feet, the formation being characterized as blue shale. The first oil showing was from 1090 to 1120 feet and the second was from 1312 to 1332 feet, while gas showings were had at 435 to 465 feet; 565 to 590 feet; 875 to 920 feet, and 1055 to 1085 feet, the first two being estimated good for one million cubic feet and three-quarters million feet, respectively.

In the Burbank field, Osage county, which continues to hold much interest as it steadily develops, numerous good completions were recorded during the week, and the field again shows a substantial gain in daily production. Interest in this field, although temporarily eclipsed by the sensational developments around Bristow, will continue to grow greater from now until the next Osage sale, June 28, especially insofar as developments between now and that date affects tracts to be offered for bids at that time. Alhough this field is now making more oil than at any time in its history, its production is still being handled successfully by the pipe lines and the threatened congestion has not come to pass. In this field, the Tidal-Osage Oil Co. No. 13, in the SW¼ of 30-27-6, was shot with 60 quarts in sand from 2926 to 2968 feet, and made 816 barrels the first 12 hours after the shot. The Gypsy Oil Co. No. 4 located in the NE¼ of the NW¼ of 32-27-6, was shot with 30 quarts in sand from 2904 to 2960 feet and is making 1000 barrels. The same company's No. 10 on this lease is making 450 barrels after a shot of 90 quarts in sand from 2904 to 2960 feet. The Sinclair Oil & Gas Co. No. 6, located in the NW¼ of the SW¼ of 29-27-6 is a 330-barrel well after a shot of 130 quarts in sand from 2915 to 2976 feet. This well is one location south of the company's No. 7, in the northwest corner of the lease, which came in at 3500 barrels several weeks ago, and was the biggest natural well in the field. This lease is offset on the north by Tract No. 30, to be put up for bids at the next sale.

Sinclair had another good completion during the week, also numbered six, located in the SE¼ of the NE¼ of 32-27-6. This well is good for about 1200 barrels after a shot of 120 quarts in sand from 2884 to 2942 feet. These and numerous other lesser wells completed during the week served to bring the field's production up to its present high mark, after it had shown a small decline last week.

Good Well Near Depew

The territory south of Depew, Creek County, known as the "14-8" country, has been getting a big play recently since the pool was opened up a month or two ago by Billingslea and Buell, and several good wells have recently been completed there. In this vicinity, Skelly Oil Co.-Phillips Petroleum Co. joint test in the SW¼ of 15-14-8, is making about 125 barrels an hour after having been drilled four feet into the pay found at 3235 feet. Top of the lime was encountered at 3186 feet, and was penetrated 49 feet before the big pay was topped. In this same quarter section, another good well is that of the Pulaski Oil Co. and Skelly Oil Co. No. 1 Fife, in the northwest corner of the SE¼ of the SW¼, which is making 100 barrels an hour at three feet in sand topped at 3238 feet.

(Continued on page 70)

Completions in Oklahoma for Week Ended May 27, 1922

OKLAHOMA

Company	Well No.	Location	Depth	Initial Prod.	Shot
Creek County					
Continental Pet. Co.	6	NWc NE 27-16-9	2954-2967	300	
Bradstreet Oil & Gas	3	SW NW 27-16-9	2835-2842	700	
Gypsy and Johnson	12	NE NE 28-16-9	2952-2955	60	
Joe Abraham	1	SE SW 33-16-9	2941-2946	48 M	
Continental	1	NWc 35-16-9	T. D. 3024	70	
Shaffer Oil & Ref. Co.	4	SEc 29-16-9	2879-2898	65	40
E. Minshall et al	3	SE SE 8-16-12	1932-1937	5 M	
Cumberland Oil Co.	3	SW SW 23-15-10	3079-3081	15	
Selby Oil & Gas	1	NWc NE 7-15-10	2930-2935	525	
W. B. Pine	9	NE SE 21-15-10	2806-2874	225	160
Sinclair Oil & Gas Co.	1	SE NW 22-19-10	T. D. 2468	Dry	
Sapulpa Fuel Co.	7	SW NW 29-19-11	T. D. 2717	Dry	
Joemac Oil Co.	1	SWc SE 14-16-9	T. D. 3845	Dry	
Williams et al	1	SW NE 4-16-10	T. D. 1075	Dry	
Williams et al	1	NWc SE 4-16-10	T. D. 3210	Dry	
T. B. Slick	1	SW SE 3-15-9	T. D. 3567	Dry	
Garvin County					
Magnolia Pet. Corp.	6	SWc 10-1n-3w	1590-1622	100	
Magnolia Pet. Corp.	4	SW SW 11-1n-3w	1860-1877	10	
Humble Oil Co.	1	NEc SE 14-1n-3w	1447-1484	100	
Wrightsman Oil Co.	1	Swc NE 12-1n-3w	T. D. 1602	Dry	
Magnolia Pet. Corp.	2-A	NE NE 16-1n-3w	1427-1465	100	
Magnolia Pet. Corp.	2-B	NE NE 16-1n-3w	1421-1462	75	
Magnolia Pet. Corp.	4	NWc 16-1n-3w	1536-1554	150	
Magnolia Pet. Co.	2	NE NW 14-1n-3w	1422-1430	15	
McClain County					
Doans Pet. Corp.	1	NW NE 20-5n-4e	T. D. 3302	Dry	
McIntosh County					
Nicholson Oil Corp.	3	NE SE 32-11-17	595-755	½ M	
Noble County					
Southwestern Pet. Corp.	3	SEc SW 10-24-1w	2101-2125	33 M	
Southwestern Pet. Corp.	5	SEc SW 10-24-1w	1769-1780 OWD	15 M	
Southwestern Pet. Corp.	6	SEc SW 10-24-1w	2131-2138	350	
Southwestern Pet. Corp.	8	SEc SW 10-24-1w	2613-2639	2000	
Okfuskee County					
Josey Oil Corp.	7	SW SE 24-11-11	2655-2674	60	40
Kingwood Oil Co.	5	NW SE 24-11-11	2661-2667	150	
Minnehoma Oil Co.	4	NE NE 24-11-11	2610-2619	200	
Oklahoma Central	14	NE NW 25-11-11	2385-2404	200	
Oklahoma Central	15	NE NW 25-11-11	2421-2439	250	
Kingwood Oil Co.	1	NW NW 4-11-12	1507-1560	15	140
Wiser Oil Corp.	4	SW SW 18-11-12	2667-2670	50	
Gypsy and Phillips	1	SWc 19-11-12	2505-2515	40	
Minnehoma Oil Co.	2	NW NW 19-11-12	2620-2626	500	
American Eagle Oil Co.	14	NW NW 16-11-11	T. D. 2745	Dry	
Lewis and Barton	1	NEc SW 13-12-11	2666-2667 OWD	150	
Gypsy Oil Co.	9	CNL SW 13-11-11	2686-2687	40	
Okmulgee County					
McCoy & Wallace	1	SWc NW 36-15-13	1768-1788	5	10
Sand Pet. Corp.	4	SE NW 31-13-12	2472-2505	25	80
Black Pet. Corp.	9	SE SW 34-12-12	2390-2396	260	10
Lutz and Webb	1	SE NW 14-11-12	T. D. 1260	Dry	
Wineland Oil Co.	8	NW SE 8-14-15	1717-1725	25	
J. A. Swindler	3	SE SE 21-14-15	2164-2177	250	
Johnson	2	SWc NE 10-13-15	T. D. 3040	Dry	
J. M. Moelendick	1	NE SW 32-15-14	T. D. 2430	Dry	
Osage Nation					
Brenner	7	NW SW 16-26-12	1363-1400	50	80
Peters et al	2	SW NE 6-22-9	2620-2636	50	30
Amerada Pet. Co.	1	NE SW 6-22-9	2575-2604	75	20
Peters and Markham	6	SW 4-23-9	2114-2182	175	50
Douglas Oil Co.	2	SW NW 28-23-9	394-406	½ M	
Sheeters et al	8	SW 33-23-12	1644-1658	30	
Douglas Oil Co.	19	SW NW 33-24-8	715-720	10	30
No. One Oil Co.	3	SE SW 17-24-9	2144-2182	200	170
Evidence Oil Co.	6	CWL SW 34-24-10	1278-1295	50	70
Osage Development Co.	19	NW 31-25-10	1955-2077	25	250
Osage Development Co.	17	NW 31-25-10	1956-2021	2.6 M	
Wabash Oil Co.	43	SE NW 15-29-9	1415-1455	50	180
Osage Oil Co.	1	SE NE 25-22-10	T. D. 2400	Dry	
U. S. Cities Oil Corp.	3	NW SE 9-22-12	T. D. 2030	Dry	
Plymouth Pet. Co.	2	SW 31-25-12	T. D. 1897	Dry	
Barnsdall	1	NE SW 11-28-6	T. D. 3241	Dry	
Burbank Pool—Osage					
Kewanee Oil & Gas	6	SE NE 4-26-6	2832-2879	300	85
Tidal Osage	8	NW SE 4-26-6	2745-2815	380	110
Cosden Oil Co.	6	SE NE 6-26-6	2833-2905	425	140
Louis Friedman	4	SEc 6-26-6	2825-2927	575	170
Midland Oil Co.	1	NWc 15-26-6	2866-2888	600	120
Cosden Oil Co.	12	NE NE 17-26-6	2873-2912	350	80
Twin States	"	SE NW 36-27-5	2915-2972	150	75
Sinclair Oil Co.	6	NW SW 29-27-6	2915-2976	330	130
Sinclair Oil Co.	6	SE NE 32-27-6	2884-2942	800 16 hrs.	120
Gypsy Oil Co.	4	NE NW 32-27-6	2904-2960	1000	30
Gypsy Oil Co.	10	NE NW 32-27-6	2681-2912	450	90
Pawnee County					
Watchorn Oil & Gas	1	SE NW 4-23-3	T. D. 2727 OWD	3½ M	
Burton & Griffith	2	NE NE 25-20-7	2485-2508	75	90
Payne County					
Magnolia Pet. Co.	6	NW SE 27-19-4	3732-3742	1100	
Stephens County					
Coline Oil Co.	1	NE SE 31-1n-5w	2188-2192	7 M	
Texas Drilling Co.	6	NE NW 32-1n-5w	2230-2244	110	
Lone Star Gas Co.	3	NE SE 24-1s-9w	1818-1914	10 M	
Magnolia Pet. o.	3	SEc NW 25-1s-9w	1792-1802	14 M	
Magnolia Pet. Co.	6	SEc NW 25-1s-9w	1753-1762	6 M	
Safety First Oil Co.	1	NE SW 20-1s-8w	1842-1850	12 M	
Poor Boy Oil Co.	1	NW NW 3-2s-8w	2214-2217	120	
Adams and McCahey	4	SE NE 27-1s-5w	605-678	10	
Powers Pet. Co.	10	NE SE 34-1s-5w	687-740	12	
Magnolia Pet. Co.	10	NE NW 34-1s-5w	742-762	8	
Pure Oil Co.	10	NE NW 34-1s-5w	685-736	18	
Lone Star Gas Co.	13	SW NE 1-2s-5w	769-790	5 M	
Mudge Oil Co.	1	NE NE 3-2s-5w	T. D. 960	Dry	
Waggoner County					
E. K. Ross	1	NWc SE 34-17-18	385-417	4 M	
Misener et al	2	NE SW 2-17-14	1452-1464	10	40

Well Making 12,000 Barrels, Initial, Puts Pioneer Pool On Map

Staff Special

HOUSTON, May 27

A SINGLE well completed at the end of the week doubled the potential production of the Pioneer pool in the southwestern part of Eastland county. It was the No. 4 Eakin test of T. B. Slick et al, which came in estimated good for 12,000 barrels daily at 16 feet in the lime formation topped at 2435 feet. The well is 1000 feet southeast of the No. 1 W. J. Bryson of the Slick and Pennant Oil Co. partnership, which was recently completed for 3000 barrels, initial production, and which at its maximum was flowing 4,400 barrels daily.

In the week ended May 24, a total of 23 wells in the Pioneer pool had shown daily average combined production of 11,187 barrels. This total included 430 barrels daily credited to the No. 4 Eakin, which had been making the smaller flow in its uncompleted state. A net increase of approximately 11,500 barrels possible production, to roundly 22,700 barrels daily, constituted the field rating at the end of the week, due to final completion of No. 4.

Field Facilities Taxed

Pipeline facilities in the pool already had been taxed prior to the coming in of this latest and largest completion on the night of May 25.—Neither of the three purchasing agencies operating in the territory were prepared to handle the production promptly and the production from No. 4 went pouring over adjacent land until it could be controlled and steps taken to care for the oil.

Prairie Pipe Line Co., which has a 4-inch outlet from the Pioneer pool to its Ranger system, is adding to its facilities through the construction of an additional 6-inch line. This, however, has not been completed. Humble Pipe Line Co. has a 6-inch outlet to connection with its Ranger system; and the Western Oil Corp. maintains field lines to loading racks, shipping out 42-45 Be. gravity oil in tank cars.

In the week ended May 24, the movement of crude from the wells by the Prairie totalled in excess of 5,800 barrels, daily average; by the Humble, roughly 3650 barrels; and by the Western Oil Corp., nearly 1800 barrels.

After the completion earlier in the month of the No. 1 W. J. Bryson of the Slick-Pennant combination, Pioneer facilities became taxed quickly. In the seven days ended May 24, the Humble handled daily average runs of 2628 barrels from it; the Prairie an average of 601 barrels daily and the Western Oil Corp. an average of 945 barrels. Until the Bryson well came in, the Prairie had been the principal purchaser at Pioneer; thereafter, the necessity for taking care of the oil brought the Humble into play as another principal outlet.

Depth of the No. 4 Eakin well, at 2435-2451 feet, compares with 2425-2460 feet for the No. 1 Bryson, which latter is 1000 feet northwest. Eastward from the No. 4 on that part of the B. L. Eakin tract where Stone & McMurray completed their No. 2 well for maximum production of 2000 barrels, the lime was topped at 2461 and the drill penetrated to total depth of 2479 feet.

Another current completion in this southwestern Eastland county pool is the No. 1 block 3, Pioneer townsite, of Dyer Bros. It got the top of the lime at 2472 feet and was drilled to total depth of 2496 feet, making 300 barrels initial production. The Dyer Bros. well is near the center of the west line of the Pioneer townsite and offsets the southeast corner of the Hill lease of the Duquesne Oil Corp.

HOUSTON, May 27.—Daily average production of the Texas fields for the past week was as follows:

	Past Week	Previous Week
Mexia-Currie	89,500	86,000
Wichita Falls dist.	51,840	52,280
Ranger, lime	74,625	66,990
Ranger sand, inc. Young county	14,650	15,850
Coastal Texas	103,885	104,825
Coastal Louisiana	4,290	4,147
San Antonio dist.	1,850	1,825
Total	340,640	331,917

Comparative Well Production

Company Lease-Well	May 17 Avg. Daily	May 24 Avg. Daily
T. B. Slick et al		
No. 1 Bryson	2728	4175
No. 1 Eakin	496	562
No. 3 Eakin	676	1116
No. 4 Eakin		430*
Litzinger & Keough Bros.		
No. 1 Gooch		49
No. 2 Gooch	233	166
No. 3 Gooch	111	32
No. 4 Gooch	103	163
Junior Oil Co.		
No. 1 Webb	165	170
No. 2 Webb	69	112
A-1 Webb	44	62
Stone et al		
No. 1 Webb	116	114
No. 2 Webb		44
F. W. Stone & Co.		
No 1 Eakin	420	375
No. 2 Eakin	2472	2095
Pioneer Petroleum Co.		
No. 1 King	136	167
Duquesne Oil Corp.		
No. 1 Hill	296	310
Dyer Bros.		
No. 1, Block 3 Pioneer Townsite		309
North Star Oil Co.		
No. 1 Webb	38	49
Pennant Oil Co.		
No. 1 Teston	105	145
No. 2 Teston	87	103
No. 3 Teston	164	166
No. 5 Teston	289	273
Totals	8,748	11,187

*Now good for 12,000 barrels daily 16 feet in lime formation at 2451 feet.

Development Report, Pioneer Pool, Eastland County, Texas

Survey	Company	Well and Number	Condition	Depth
W. W. Grimes	Brown Oil Co.	W. A. Eakin 1	Drilling	1600
Doyle Lot 3, Block 6	Brown & Co.	Pioneer townsite 1	Shut down for 8-in.	1690
Doyle Lot 3, Block 18	Brown & Co.	Pioneer townsite 2	Shut down	130
Thos. Benson	Center & Lightfoot	L. E. Brannon 1	Set 10-in.	1033
Thos. Benson				
Sec. 6, blk. 10	Cohen et al	Rose farm 1	Drilling	530
Sec. 6, blk. 15	Cohen et al	Rose farm 2	Location	
Sec. 6, blk. 13	Cohen et al	Rose farm 3	Location	
Sec. 6, blk. 13	Cohen et al	Rose farm 4	Location	
Doyle Blk. 4	Cons. Oil Co.	Pioneer townsite 1	Shut down	120
W. S. Lugs	Conley et al	Stubblefield 1	Drilling	1200
J. Douglas	Cullen et al	E. L. Flippen 1	Location	
Thos. Benson	Duquesne Oil Corp.	E. L. Hill 2	Drilling	1000
W. R. O'Neal	Duquesne Oil Corp.	W. R. Smith 1	Drilling	955
W. R. O'Neal	Duquesne Oil Corp.	W. R. Smith 2	Drilling	1960
W. R. O'Neal	Duquesne Oil Corp.	W. R. Smith 3	Spudding	
W. R. O'Neal	Duquesne Oil Corp.	W. R. Smith 4	Set 10-in.	1625
W. R. O'Neal	Duquesne Oil Corp.	W. R. Smith 5	Drilling	710
W. R. O'Neal	Duquesne Oil Corp.	W. R. Smith 6	Rig	
H. & T. C. Sec. 66, blk. 3	Drury Petroleum Co.	J. E. Luse 1	Changing to standard tools	2699
Sec. 66, blk. 32	Drury Petroleum Co.	Pioneer townsite 1	Drilling	1460
Sec. 66, blk. 23	Drury Petroleum Co.	Pioneer townsite 2	Rigging up	
Sec. 66, blk. 9	Drury Petroleum Co.	Pioneer townsite 3	Fishing	460
Sec. 66, blk. 33	Drury Petroleum Co.	Pioneer townsite 4	Rigging up	
Sec. 66, blk. 20	Drury Petroleum	Pioneer townsite 5	Location	
L. Pamplin center of 1 A blk. Blk. 3	Dyer Bros. Dyer Bros.	E. M. Curry 1 Pioneer townsite 1	Spudded and shut down Toplime 2472-300 Bbls.; drilling deeper	2497
M. L. Smith	Goodland & McDeemy	J. H. McDonald 1	Cellar dug	
L. Pamplin	Gulf Prod. Co.	E. M. Curry 1	Drilling	1975
Doyle Lot 3, Blk. 30	Hill & Beggs	Pioneer townsite 1	Drilling	1440
Doyle Lot 3, Blk. 29	Tom Holden	Pioneer townsite 1	Drilling	2200
L. Pamplin	Humble Oil & Refining Co.	T. J. McClure 1	Shot 150 at 2440-2495	

(Table continued on next page)

Sinclair Is Building Line In Panuco Field

Staff Special

TAMPICO May 25.—Sinclair-Mexican Oil Corp., having contracted for 10,000 barrels Panuco crude daily from the International Petroleum Co., is completing 8-inch pipe line and pumping station from its Zurita property to the Cacalillao well of the International, a distance of about five miles northwest of previously existing production in this general heavy oil territory.

North of Cacalillao, in hacienda Paciencia, the Transcontinental Petroleum Co., (Standard of New Jersey) has made one definite location in the southwest corner and will drill other tests should its No. 1 Cacalillao prove a good producing well. This hacienda is held by the Penn-Mex Fuel Co. (South Penn Oil Co.) with which the Transcontinental has formed an operating agreement.

In "wildcat" territory out from Southern district light oil production, Mexican Eagle Oil Co., Ltd., (El Aguila) is constructing five fuel tanks of 500 barrels capacity each in preparation for the rainy season.

On the Limon hacienda, due west of Panuco, where Marland Oil Co. of Mexico, S. A. recently brought in an 8,000 barrell well at 1700 feet, locations have been made for tests up to No. 8 No. 3 on the 280,000 acre tract acquired from the Compania Franco-Espanola two or three years ago which is drilling in hard blue shale below 1730 feet and No. 4 is in dark gray shale at 420 feet; material is being hauled for Nos. 5, 6 and 7; No. 8 is a location.

McCaw Well Quickly Shows B. S. Content

Staff Special

HOUSTON, May 27.—The No. 1 McGaw test of the J. K. Hughes interests, rated a 1450-barrel well after its completion in the Currie-Wortham pool of Navarro county, quickly developed emulsion and its b. s. content now is in excess of 40 per cent.

In Kaufman county, near College Mound, the Humphreys-Texas Co. test on the Clarida tract has been abandoned in salt water at 3222 feet. It is one of roughly a half dozen tests so far to have encountered failure in the eastern part of Kaufman county, where a dozen or more other tests are still drilling in wildcat territory.

Mexia production, Limestone county, averaged 89,790 barrels daily over the week, roughly 32,150 barrels crediting to the Humphreys interests and the remainder to other operators.

Directory of oil and gas companies of Kentucky has been compiled by P. C. Matthews, secretary of the Young Gasoline & Refining Co., of Lexington, and is ready for distribution on June 1. It contains a list of producers, field statistics and other information which pertains to Kentucky producing, refining and marketing.

Development Report, Pioneer Pool, Eastland County, Texas

Survey	Company	Well and Number	Condition	Depth
L. Pamplin	Humble Oil & Refining Co.	T. J. McClure 2	5 M Gas Top of lime 2402 Shut down	2495 2402
L. Pamplin	Humble Oil & Refining Co.	T. J. McClure 3	Drilling	1575
E. T. RR. Sec. 21, Blk. 2	Invincible Oil Corp.	S. D. Nelson 1	Set 8 in.	1650
W. G. Watkins	Keough Bros. & Litzinger	J. N. Gooch 4	Shot 40 at 2487-2498 No results	2503
W. G. Watkins	Keough Bros. & Litzinger	J. N. Gooch 5	Rig	
H. C. Rea	Keough Bros. & Litzinger	W. R. Smith 1	Fishing	2323
H. C. Rea	Keough Bros. & Litzinger	W. R. Smith 2	Rig	
Thos. Benson	Keough Bros. & Litzinger	W. R. Smith 3	Rigging up	
Pioneer Townsite Block 16	Knox et al	Pioneer 1	Shut down	1140
E. H. Brooks	Litzinger et al	W. A. Albin 1	Rig	
E. H. Brooks	Litzinger et al	W. B. Webb 1	Rig	
H. & T. C. Sec. 28, blk. 4	Mascho Bros.	Stubblefield 1	Spudding	
Sec. 28, blk. 4	Massie et al	Stubblefield 1	Shut down	1530
G. Robinson	Chas. McBride et al	J. P. Maxwell 1	Shut down	850
Pioneer Townsite Block 19	Mayeemock	Townsite 1	Set 10-in.	1100
L. Pamplin center of 4½ acres	Geo. McCamey et al	E. M. Curry 1	Shut down	499
S. H. Hines	Geo. McCamey et al	W. S. Johnson 1	Shut down	1139
P. Norton	Geo. McCamey et al	Mrs. Moore 1	Pulling pipe	2468
L. Pamplin	Miller & Malloy	J. N. Gooch 1	Under-reaming 8-in.	1860
S. Lackeman H. & T. C.	Miller & Malloy	A. F. Tate 1	Drilling	1645
Sec. 37, blk. 4	Miller et al	J. T. Watson 1	Shut down	1460
Sec. 37, blk. 31	Montgomery & Ray	Pioneer townsite 1	Location	
L. Pamplin center of 1 acre	Moore-Tex Oil Co.	W. L. Browning	Rig up	
Pioneer Townsite Block 35	Oriental Oil Co.	Pioneer townsite 1	Rig on ground	
L. Pamplin	Owenwood Oil Corp.	W. L. Browning 1	Rigging up	
L. Pamplin	Owenwood Oil Corp.	W. A. Eakin 1	Drilling	300
W. J. Bryson	Slick & Pennant	W. J. Bryson 1 (west)	Shot 125 at 2489-2519 Bridged at 1400 cleaning out	2015
W. J. Bryson	Slick & Pennant	W. J. Bryson 1	Deepened 5½ ft. increased flow 500 bbls. 2458 to 4,400 bbls.	
T. Barber	Slick & Pennant	W. J. Bryson 2	Location	
T. Barber	Slick & Pennant	W. B. Bryson 3	Location	
Thos. Benson	Slick & Pennant	E. L. Teston 4	Rigging up	
R. G. Teston	Slick & Pennant	E. L. Teston 5	Completed 300 bbls.	2489
R. G. Teston	Slick & Pennant	E. L. Teston 6	Drilling	1710
R. G. Teston	Slick & Pennant	E. L. Teston 7	Rig blown down	
E. H. Brooks	Slick & Pennant	B. W. Webb 1	Drilling	1725
W. C. Grimes	Pioneer Production Co.	Baird Heirs 1	Rig up	
Doyle	Pioneer Production Co.	L. King 2	Under-reaming 8-in.	1700
Doyle	Pioneer Production Co.	L. King 3	Location	
Douglas	Pioneer Production Co.	L. King 4	Location	
Douglas	Pioneer Production Co.	L. King 5	Location	
W. J. Thompson	Rainbow End Co.	D. G. Armstrong 1	Drilling	2140
W. J. Thompson	Rainbow End Co.	D. G. Armstrong 1-B	Location	
Thos. Benson	Rainbow Oil Co.	Harris 1	100 bbls. fluid in tanks	2547
A. B. & C. Sec. 7	Roberts Interests	G. Roberts 1	Shut down	2530
J. P. Douglas	Samuels, West & McCandless	Martin 1	Rig	
J. Douglas	Samuels, West & McCandless	E. L. Flippen 1	Location	
A. J. McGowan	H. W. Seman et al	G. W. Garey 1	Location	
L. M. Crisman	H. B. Shinhole et al	Stubblefield 1	Spudding	
W. G. Watkins	T. B. Slick et al	B. L. Eakin 2	Drilling	2060
W. G. Watkins	T. B. Slick et al	B. L. Eakin 4	Toplime 2435, 12,000 bbls.	2451
McKineheloe	States Oil Corp.	W. J. Martin 1	Rigging up	
J. P. Douglas	States Oil Corp.	W. A. Martin 1	Rig	
W. R. O'Neal	States Oil Corp.	W. R. Smith 1	Spudding	
W. R. O'Neal	States Oil Corp.	W. R. Smith 2	Building rig	
Sam Damon	R. G. Stearns	H. L. Vestal 1	Shut down	2440
H. C. Rea	Stone & Co.	B. L. Eakin 3	Toplime 2430; Dry gas	2462
W. G. Watkins	Stone & Co.	B. L. Eakin 4	Drilling	509
J. McGloin, Sec. 798, blk. 5	Williams Drilling Co.	L. King 1	Spudded and shut down	
J. McGloin, Sec. 798, blk. 5	Williams Drilling Co.	L. King 2	Location	
W. C. Wheat,	White Oil Corp.	G. W. Young 1	Rig	

California Operators Shut Down Production

SAN FRANCISCO, May 26.—In the latest issue of the weekly bulletin of the California State Mining Bureau, R. E. Collom, state oil and gas superviser, describes as follows the partial shut-down of producing properties in California which has resulted from the over-production of crude oil:

"Apparently realizing the necessity of bringing about a more equable relationship between production and consumption of petroleum in spite of the over-production brought about by the rapid drilling of new fields the larger companies have shut in about 20,000 barrels of oil daily. This was accomplished by shutting down 580 producing wells in the older fields of the San Joaquin Valley and Santa Maria District.

"Union Oil Co. of California, the successful discoverer of the valuable production at Santa Fe Springs oil field, on May 22 shut down over 100 wells, being all but its line wells, on 11 properties in the Santa Maria district. A number of producing wells were also shut down in Coalinga. Shell Co. of California, discoverer of Long Beach oil field and with a daily production of about 6000 barrels in that field, has shut down approximately 100 wells in the Coalinga field with an estimated average daily production of 5000 barrels. Standard Oil Co. has about 30 wells shut in in Kern county representing 4000 barrels daily. Pacific Oil Co. has shut in the daily production of 3500 barrels from 170 wells in the Coalinga and Midway fields. General Petroleum Corp. has about 150 wells shut in which normally produce about 2000 barrels of oil daily.

"Approximately 2,000,000 barrels of crude oil was run to storage during April, 1922, increasing the state's storage to a total of almost 37,000,000 barrels. Field storage facilities of the state can hold about 78,000,000 barrels of oil. Ninety per cent of these facilities are owned by the three large marketing companies: Associated, Standard and Union Oil. At least 4,000,000 barrels should be deducted from total storage in considering quantities available for the market. This represents the oil which lies below outlets in reservoir and tank bottoms and therefore is not available for the market. At the present rate of consumption, about 270,000 barrels daily, there is a four months' supply of oil in storage. At the present ratio between production and consumption the remaining storage space will be filled in 20 months.

"According to reports of oil field development operations filed with R. E. Collom, state oil and gas supervisor, drilling is actively concentrated in the new oil fields of the state whereas development of the older fields has been slowed down and production shut in so as to make way for the high grade flush production of the new fields which together with small consumption is forcing large quantities of oil into storage. Fifty per cent of the new drilling reported, since January 1, 1922, has been for the four new fields, as follows: Long Beach, 80 wells; Huntington Beach, 73 wells; Santa Fe Springs, 56 wells; and Elk Hills, 41 wells. The combined production of these fields from the 250 producing wells is about 75,000 barrels daily, which is one-fourth of the present daily consumption of crude and 7000 barrels per day more than the present daily surplus of production over consumption."

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Damage By Wind Storms Holds Back Development In North Louisiana

By Special Correspondent

SHREVEPORT, May 27

DECLINES all along the line, in number of completions, number of producers, initial production and daily average production, were recorded in the Shreveport territory, including El Dorado, Arkansas, during the week just closed. The daily average production, with decreases in Haynesville and Homer and small increases in all other districts, amounted to 121,285 barrels, a decrease of 3,414 barrels for the week.

The week's field record showed 47 completions, including 2 gassers, 9 failures and 36 producers with combined initial yield 8,718 barrels, compared with the preceding week's record of 51 completions, including eight failures and 43 producing wells with combined initial producton 12,099 barrels. There was a decline of 11 in number of completions, a decline of seven in number of producers and a decline of 3,381 barrels in initial production.

The principal cause mentioned for the falling off in field results is the weather, which was unusually unfavorable during the past week. Twice there were severe wind storms with heavy downpours of rains, resulting in scores of derricks being felled and other damages entailed, and, also, causing some of the drilling activities to be temporarily suspended. The Haynesville field suffered especially heavy losses in the blowing down of derricks.

The bulk of the decline in initial yield during the past week was in the Haynesville district; in fact, this was the only district showing a decrease in production. It registered 23 completions, three of them failures, and 20 being producers with combined initial yield 3,909 barrels, compared with the preceding week's record of 35 completions, including three failures and 32 producers with combined initial yield 10,569 barrels, the decline for the seven days amounting to 6,660 barrels of initial yield.

The Caddo district reported only one completion, a producer of 1,000 barrels initial yield, compared with the preceding week's showing of two producers yielding 540 barrels, the increase being 460 barrels.

In Bossier parish, including the Elm Grove and Bellevue districts, there were five producers, with combined initial yield 654 barrels, against the previous week's record of 95 barrels from two producers. Bellevue showed four producers with combined initial yield of 639 barrels against its previous week's record of one producer yielding 30 barrels, and Elm Grove this week showed one producer yielding 15 barrels against the previous week's record of one producer yielding 65 barrels. The week just closed had no failure marked against it, compared with three failures of the preceding week, two of them in Bellevue and one a wildcat.

The DeSoto-Red River territory reported one producer, initial yield 30 barrels, being in DeSoto parish, compared with the preceding week's record of one failure, in Red River parish.

There was more disappointment registered in Webster parish, where many operations have taken place in a hunt for pay oil. Three failures were recorded during the week. One was in the Monzingo district, namely, the Woodward-Walker No. 1 of A. J. Ducate et al., in 20-18-8, which encountered salt water and was abandoned, at 2718 feet. The others were in the Minden district, namely: the Turner No. 1 of R. J. Barry et al., in 26-19-10, at 500 feet, dry, and the Goodwill Oil Co.'s Crompton No. 1 in 31-19-10, at 435 feet, dry, and abandoned.

SHREVEPORT, LA., May 26.—A decline amounting to 3,414 barrels was shown in daily average production in the Shreveport territory during the week just closed, when the total was 121,285 compared with 124,699 barrels of the previous week. By districts the comparative daily averages were:

	Past Week	Previous Week
Caddo light	8,012	7,850
Caddo heavy	3,510	3,420
Red River-De Soto	8,040	7,800
Haynesville	48,698	51,872
Homer	15,930	16,875
Bellevue	2,115	2,100
El Dorado	34,980	34,782
Total	121,285	124,699

In the Monroe (northeastern Louisiana) district there were three completions, one a failure, and the others gassers, of 12 and 13 million cubic feet respectively.

The El Dorado (Arkansas) district showed an increase of two in number of producers and 2,230 barrels on initial yield. Its record for the week was 11 completions, two failures and nine producers with combined initial yield 3,125 barrels, compared with the previous week's record of one failure and seven producers yielding 895 barrels.

For the first time in several weeks El Dorado district reported the largest producer, a distinction Haynesville had been enjoying. The well in question was the Woodley Petroleum Co.'s Burns No. 2 in 32-18-15 at 2155 feet, 2,000 barrels, estimated initial yield. No other El Dorado producer showed initial yield of more than 250 barrels. The largest completion in Haynesville was the Ohio Oil Co.'s J. T. Walker account 1 No. 12 in 14-23-8 at 2825 feet, 965 barrels. The next largest producer in Haynesville was the Transcontinental Oil Co.'s Lee No. 3 in 17-23-8 at 2773 feet, 370 barrels. The Ohio company led in number of completions, with eleven, all producers.

Completions during the week were as follows:

Haynesville

Amerada Petroleum Corp. Baucum B-5, in 18-23-8, at 2793 feet, 165 barrels.
A. T. Benson, Miller No. 1 in 18-23-8, at 2793 feet, 250 barrels.
Gilliland Oil Co., G. W. Taylor A-6 in 14-23-8 at 2792 feet, 60 barrels.
Gilliland Oil Co., F. M. Taylor A-1 in 13-23-8, at 2847 feet, 270 barrels.
Gilliland Oil Co., Sherman No. 7 in 23-23-8, at 2827 feet, 150 barrels.
Glassell et al, Gaines No. 1 in 18-23-8 at 2763 feet, 108 barrels.
Houston Oil Co., J. H. Knox No. 1 in 20-23-8 at 2805 feet, salt water, aband.
Owenwood Oil Corp., Camp No. 1 in 19-23-8 at 2803 feet, salt water, aband.
Ohio Oil Co., Beene No. 1 in 22-23-8 at 2781 feet, 94 barrels.
Ohio Oil Co., R. P. Bond No. 16 in 21-23-8 at 2775 feet, 117 barrels.
Ohio Oil Co., R. P. Bond No. 18 in 21-23-8 at 2779 feet, 130 barrels.
Ohio Oil Co., J. L. Bond No. 1 in 22-23-8, at 2785 feet, 100 barrels.
Ohio Oil Co., Goodwin No. 1 in 16-23-8 at 2810 feet, 170 barrels.
Ohio Oil Co., T. W. Sherman No. 6 in 16-23-8 at 2836 feet, 135 barrels.
Ohio Oil Co., G. W. Taylor No. 1 in 15-23-8 at 2827 feet, 100 barrels.
Ohio Oil Co., G. W. Taylor No. 5 in 15-23-8 at 2810 feet, 40 barrels.
Ohio Oil Co., G. W. Taylor No. 6 in 15-23-8 at 2797 feet, 53 barrels.
Ohio Oil Co., G. W. Taylor No. 59 in 15-23-8 at 2801 feet, 142 barrels.
Ohio Oil Co., J. T. Walker Acct. 1 No. 12 in 14-23-8 at 2825 feet, 965 barrels.
A. C. Reese, School No. 1 in 8-23-8 at 2828 feet, 250 barrels.
D. C. Richardson, Miller No. 4 in 17-23-8 at 2781 feet, 240 barrels, estimated.
Smitherman-McDonald, W. S. Sanders No. 1 in 19-23-8 at 2820 feet, dry, aband.
Transcontinental Oil Co., Lee No. 3 in 17-23-8 at 2773 feet, 370 barrels.

Caddo Parish

Dixie Oil Co., Robertshaw No. 42 in 14-21-15 at 1664 feet, 1,000 barrels.

Webster Parish

A. J. Ducate et al, Woodward-Walker No. 1 in 20-18-8, at 2718 feet, salt water.
R. J. Barry, trustee, Turner No. 1 in 26-19-10, at 500 feet, dry, abandoned.
Goodwill Oil Co., Crumpton No. 1 in 31-19-10, at 435 feet, dry, abandoned.

Bossier Parish (Bellevue)

Autrey et al, Elston No. 5 in 10-19-11, at 329 feet, 560 barrels, estimated.
Louisiana Oil Refining Corp., Fee A-13, in 15-19-11, at 325 feet, 50 barrels.
National Refining Co., Elston No. 4 in 10-19-11 at 351 feet, 25 barrels.
Bliss et al No. 6 in 10-19-11, at 386 feet, 4 barrels, flowing.

Bossier (Elm Grove)

The Texas Co., Caplis No. 5 in 24-16-12, at 1554 feet, 15 barrels.

DeSoto Parish

Elam et al, Lanier No. 1 in 9-11-11 at 2749 feet, 30 barrels.

Monroe District

Southern Carbon Co., No. 8 in 13-19-4, at 2160 feet, 13 million cu. ft. of gas.
Huber Carbon Co., Roy No. 1 in 13-19-4 at 2162 feet, 12 million cubic feet gas.
Mangham Oil & Gas Co., Baker No. 2 in 4-15-7 at 2800 feet, salt water, aband.

El Dorado (Arkansas)

Anderson et al, Traylor No. 1 in 14-19-15 at 2113 feet, 250 barrels.
Ark. Oil & Lease Exchange, Benson No. 1 in 9-19-15, at 2165 feet, 200 barrels.
Boyle et al, Greenlee No. 2 in 33-18-15 at 2150 feet, junked and abandoned.
Fullilove Drilling Co., Mann No. 4 in 29-18-15 at 2169 feet, 175 barrels.
E. M. Jones, Thurkill No. 2 in 28-18-15 at 2134 feet, 150 barrels.
J. L. Nelson, Cullins No. 1 in 4-19-15 at 2149 feet, 20 barrels.
Olvey et al, Mann B-1, in 29-18-15 at 2181 feet, 200 barrels.
Olvey et al, Mann B-2, in 29-18-15 at 2198 feet, 100 barrels.
Woodley Petroleum Co., Burns No. 2 in 32-18-15 at 2155 feet, 2,000 barrels, est.
Woodley et al, Hill No. 1 in 17-18-14 at 2229 feet, salt water, abandoned.
E. G. Trull, No. 2 in 25-17-16 at 2193 feet, 30 barrels pumping.

"Mystery" Company Stringing Pipe For Line, Casper To Salt Creek

By Special Correspondent

CASPER, WYO., May 26

OIL OPERATORS and oil companies in the Rocky Mountain region are puzzled over who Max Ball represents, who is financing his program in Wyoming, where he is going to get the oil for his pipe line from the Salt Creek field to Casper, and what he is going to do with it when it is piped to Casper.

These are problems which enter into any discussion of the progress of the Western Pipe Line Co. The company is going ahead with its construction program, that is, building its line from the Salt Creek field to this city, without placing any stock for sale or asking producers to take their oil.

Of interest is the fact that the Western Pipe Line Co. filed a mortgage for $1,000,000 to the United States Mortgage & Trust Co. of New York City, in the office of county clerk in Natrona county here, recently. The bonds issued are of $1000 denomination and bearing 10 per cent interest. Although only recently filed here, it was dated July 1, 1921. The bonds are due in 1931 and the interest is to be paid semi-annually. The instrument which is a mortgage and deed of trust, was prepared by James R. Jones, general counsel of the pipe line company.

The Western Pipe Line Co. was chartered in 1921 under the laws of Colorado with an authorized capital of 1000 shares of no par value. All shares have been issued. Besides Max W. Ball, president; James R. Jones is vice-president and general counsel; Marie V. Schiffer is secretary and treasurer. The executive offices are located at 1104 First National Bank building, Denver, Colo., while the operating offices are at 417-18 Consolidated Royalty Building, Casper, Wyo. J. C. Lindsay is the company's engineer.

Max W. Ball was connected with the geologic and administrative work for the U. S. Geologic Survey, including five years as chairman of the U. S. Geological Survey Oil board, one year law officer of the U. S. Bureau of Mines, and four years law officer of the U. S. Bureau of Mines. While in the government service, he supervised the compilation of a bulletin on Petroleum Withdrawals and Restorations, affecting the public domain. Mr. Ball also is president of the Ute Petroleum Co., which is now drilling a test well in the Uinta Basin in Utah.

He was in charge of the activities of the Royal Dutch-Shell interests in the Rocky Mountain region, before organizing the Western Pipe Line Co. James R. Jones was law officer in the Department of Interior, but later was with the legal department of the Royal Dutch-Shell at Cheyenne, where Mr. Ball was located while with the Dutch-Shell interests. Mr. Lindsay, the engineer in charge of construction work, is from California.

Associates Unknown

President Ball has never disclosed who are associated with him in the project, as far as is known. He has been connected with the Royal Dutch-Shell, the Standard, Texas, Gulf, German, and Japanese interests, by outsiders. He has simply replied to all who sought to learn who was with him in the business, that the company was building a line as a purely business project and the line would be a common carrier, to be at the service of anyone who desired to have oil transported from Salt Creek to Casper. The company has started the pipe line quietly, purchasing where necessary, asking no favors and in nearly all transactions taking a cash discount on purchases.

CASPER, WYO., May 29.—Pipe line runs from Wyoming and Montana fields for the past week were as follows:

	Past Week	Previous Week
Salt Creek	51,775	47,735
Big Muddy	4,085	3,800
Lance Creek	860	850
Dallas	330	330
Pilot Butte	110	110
Lander	120	120
Grass Creek	5,196	5,160
Elk Basin	2,276	2,200
Cat Creek, Mont.	4,557	4,410
Osage	450	300
Greybull	55	50
Byron	140	140
Rock Creek	6,760	6,800
Totals	76,714	72,005

Nearly all of the 8-inch pipe has been strung for a distance of about 28 miles. Thirty-two miles of the 6-inch pipe has been unloaded here, and 25 trucks of the White Motor Co. are hauling this and stringing it on the right-of-way. Six-inch pipe will be used from the field to the top of the hill, a distance of 16 miles. There is to be a station in the Salt Creek field and one midway between the field and Casper.

There will be two 55,000-barrel tanks here at first, with another to be added if found necessary. The Northwestern and the Burlington railroad companies will pass through the Casper terminus, a loading rack with a 5,000-barrel capacity having been provided to convey the crude to either of the railroad lines.

Gulf and Standard Flirt?

There is a persistent rumor prevalent here that the Standard and Gulf Oil Corp. interests are flirting with each other, although such a report has been denied by local Standard Oil Co. of Indiana officials. F. A. Leovy of Pittsburgh and Underwood Nazro of the Gulf Production Co., of Houston, were in Casper recently as announced previously, and inspected the Standard refineries here and the properties of the Midwest. It was strictly a friendly visit, as it is generally known that no rivalry exists between these two companies. This visit is being repaid this week by Midwest and Standard officials, who are reported to be on their way to Tulsa and the southwest to inspect the properties of the Gulf.

Included in the party of local men were R. S. Ellison, operating executive of the Midwest Refining Co.; E. L. Estabrook of the land department of the Midwest, and James W. Stewart, son of the titular head of the Standard. It is said that other Standard officials joined the party from Chicago.

Oil men in general throughout the Rock Mountain region were astonished at the great production secured from the Fensland Oil Co.'s well in the southern section of the Salt Creek field. The estimates on the daily production are from 2500 to 10,000 barrels. It is by far the best completion in the Salt Creek field in many weeks. This well is on the southeast of the northwest quarter of 20-39-78.

A gauge of the well, flowing through the tools, for nine hours, is said to have shown better than 1000 barrels. It was then shut in because of lack of storage facilities.

It is not known how thick the sand is, but because it is 60 to 80 feet thick in other parts of the field, it is reasonable to suppose that deeper drilling will greatly increase the well's output.

Oil Train is Wrecked

The crude oil special from Casper, and headed for the Imperial Oil Co., at Regina, Sask., Canada, was wrecked on the railway bridge, five miles east of Bonneville, this week. A fire had weakened the approach to the bridge and after the engine and one oil car had passed safely over, the next six cars fell through and caught fire. The larger portion of the train was destroyed, and more than 60,000 gallons of crude was burned. None was injured.

Reports from Osage, Wyo., Weston county, eastern Wyoming, indicate that the Clay Spur refinery at Osage will be started up early in June. The company recently secured about three miles of pipe for gathering lines which are now being laid to connect up wells in the shallow section of the field. The United States Oil and Refining Co., has increased its runs to such an extent that it is now handling about 500 barrels daily. The total capacity of the plant is 750 barrels.

It is reported here that French capitalists interested in the Franco-Wyoming Oil Co. are on their way to Wyoming, having left Paris on May 5. They expect to visit in eastern cities and probably will not arrive here before June 1.

The California Co. of Wyoming has secured equipment for pumping its well in 2-34-84 in the Pine Mountain region, which recently was shot with 20 quarts of nitroglycerine. It is believed that the well will make about 50 barrels of high grade lubricating oil.

In the same district, the Alaska Oil Development Co. is down 400 feet with its No. 5 test on Sec. 35, and is preparing to spud in on No. 6, on the upper part of this structure.

Mutual in Property Deal

Negotiations for the acquisition of more oil companies in Wyoming have been nearly closed in New York City by the Mutual Oil Co. representatives, according to what are considered to be reliable reports. The Mutual company, which recently took over the Gates and the Elk Basin Consolidated companies, is now about to obtain the control over the Chappell, Western Oil Fields and Boston-Wyoming companies.

If this company is able to control these latter three companies it should become one of the largest and most important companies in the Rocky Mountain district. By obtaining control of these three companies, the Mutual would fall into some very valuable producing properties in the Salt Creek field. It would include refineries at Chanute, Kas., and at Glenrock and Cowley, Wyo., with many service stations throughout the Rocky Mountain region and middle west.

The New York Oil Co. has an oil well in its No. 4 in 11-33-83 in the Poison Spider field, about 30 miles due west of here in Natrona county. It has an estimated production of 75 barrels daily. This was at first a four million cubic foot gasser on the western edge of the field. It was cleaned out and put down deeper recently, resulting in oil at 1450 feet.

Production, Imports And Consumption Show Declines In April

Staff Special
WASHINGTON, May 26

FOR the first time since October 1921, daily average production in the United States showed a decrease in April, according to the statement for the latter month just issued by the United States Geological Survey. The loss for the entire country, including California, was 15,756 barrels from the daily average of March.

Including the October figures, the daily production by months has been: been:

October	1,146,420
November	1,262,667
December	1,353,452
January	1,391,645
February	1,457,642
March	1,504,323
April	1,488,567

The loss for the country east of California would have been much greater had it not been for the gain in daily averages of that state of more than 8,000 barrels in April. The principal loss in production was sustained by Louisiana, whose daily average dropped 40,506 from the March figure. This was occasioned by the big slump in Haynesville output.

Oklahoma gained 14,900 barrels over March, the Survey crediting the state with daily production of more than 400,000 barrels. Figures published by **National Petroleum News** in the issue of May 10 credited this state with an increase of 15,000 barrels in daily averages over March and with a daily average in April of 407,000 barrels.

Other states of the Mid-Continental and Southwestern area showed little change. Mexia's big slump was recorded previous to this report. Wyoming showed a gain, largely a reflection of increased takings from the shut-in Salt Creek field. Most of the eastern states registered losses, Illinois being hardest hit.

The increased field activity is recorded by 1,442 completed oil wells during the month compared with 1,323 in March and the low mark of 752 in October.

From figures which are gathered weekly by **National Petroleum News**, it is indicated that the April report is in most respects applicable to the May production. Haynesville has made some gain as has Burbank, but these are offset by declines elsewhere.

Production in April by states, with change over March is shown in the following table:

Daily Average Production by States in April, with Change Over March

State	April Daily Barrels	Change Over March
Oklahoma	400,667	+14,925
Texas		
Central & North	261,366*	− 2,666
Coastal	91,167	+ 3,973
Totnl	**352,533**	**+ 1,307**
California	340,300	+ 8,106
Louisiana		
Northern	84,400	−40,213
Coastal	3,900	− 293
Total	**88,300**	**−40,506**

Daily Average Production by State in April, with Change Over March

	April Daily Barrels	Change Over March
Kansas	87,400	− 1,245
Wyoming		
Salt Creek	47,500	+ 5,274
Other Fields	19,400	+ 1,645
Total	**66,900**	**+ 6,919**
Arkansas	37,100	+ 3,713
Kentucky	24,707	− 448
Illinois	22,567	− 5,755
Pennsylvania	19,933	− 390
West Virginia	19,767	− 1,136
Ohio		
Central & East	12,266	− 928
Northwestern	5,467	− 210
Total	**17,733**	**− 1,138**
Montana	4,966	− 163
Indiana		
Southwestern	2,233	+ 136
Northeastern	600	− 77
Total	**2,833**	**+ 59**
New York	2,567	− 14
Colorado	267	+ 22
Tennessee	27	− 12
Grand Total	**1,488,567**	**−15,756**

*Includes 1,354,000 barrels Mexia crude produced in previous months but transported from producing properties in April.

While domestic production was declining, there was a loss in the daily average imports of crude from Mexico amounting to 63,096 barrels from the March average. This loss was in the Mexican oil brought into the Atlantic Coastal ports, the Gulf ports receipts showing a gain. The total of domestic production and imports, less the exports, was 83,000 barrels less daily than in March, as shown by the following table:

Daily Average Imports and Exports of Crude Petroleum

Imports

	April	Change Over March
From Mexico	388,646	−61,160
From Other countries (not given)		− 1,936
Total	**388,646**	**−63,096**

Ports of Entry

Atlantic Coast	168,530	−105,363
Gulf Coast	219,282	+42,723
Pacific Coast	167	+ 167
Mexican Border	667	− 623
Total	**388,646**	**−63,096**

Exports From U. S.

Domestic Crude		
To Canada	26,174	+ 8,039
To other countries	4,446	− 3,151
Foreign Crude Oil	(not given	− 272
Total	**30,620**	**+ 4,616**
Excess, Imports Over Exports	358,026	−67,712

Daily Average Production and Imports Minus Exports

	April	Change Over March
Domestic	1,488,567	−15,756
Imported	358,026	−67,712
Total	**1,846,593**	**−83,468**

The declines in production and imports, however, were more than offset by the slumping off of the domestic consumption, as indicated by deliveries to consumers. This loss amounted to 194,871 barrels over the previous month. The principal loss in deliveries came in the Mid-Continent. The following tables show in detail the deliveries of crude oil in April:

Daily Average Consumption of Domestic and Imported Crude in U. S. (Deliveries to Consumers)

Domestic

Field	April	Change Over March
Appalachian	77,834	+ 60
Lima-Indiana	8,433	+ 4,723
Ill. & Sw. Ind.	7,067	− 18,223
Mid-Continent	594,400	− 71,215
Gulf Coast	67,033	+ 6,291
Rocky Mtn.	71,600	+ 5,955
California	280,200	− 10,381
Total domestic	**1,106,567**	**− 82,820**
Less Exports	30,620	+ 4,888
Net	**1,075,947**	**− 77,932**
Consumption, Imported	294,900	−116,939
Total consumption	**1,370,847**	**−194,871**

Stocks of domestic crude oil east of California increased more than nine and one-half million barrels in April as compared with nearly nine million barrel increase in March, resulting in total stocks east of California, adjusted for water and B. S. of 174,500,000 barrels. The California stocks increased more than 1,800,000 and stocks of Mexican crude and topped oil gained 2,800,000.

Pipe Line and Tank Farm Stocks of Petroleum on Last Day of Month (Stocks East of California adjusted for Water and B. S.) (Figures in Thousands of Barrels)

Field	April 30	Change Over March 31
Appalachian		
(N. Y., Pa., W. Va., East & Cent. Ohio	5,050	− 17
Kentucky	2,614	+ 60
Lima-Indiana	1,030	− 71
Ill. Sw. Ind.	8,914	+ 532
Mid-Continent		
(Okla., Kan., Cent. & N. Texas)	118,572	+7,623
N. La. and Ark.	14,929	+ 673
Gulf Coast	22,018	+ 841
Rocky Mtn.	1,444	+ 16
Total east of Cal.	**174,571**	**9,657**
California (gross)	39,795	+1,895
Mexican Stocks		
Atlantic Coast Stations		
Crude	8,445	+ 953
Topped in Mexico	2,060	− 163
Gulf Coast Stations		
Crude	9,686	+1,512
Topped	1,303	+ 510
Total Mexican	**21,494**	**+2,812**
235,860		**+14,272**

Total net Pipe Line and Tank Farm Stocks East of California, gross pipe line, tank farm and producers stocks in California and stocks of Mexican petroleum held in the United States by importers.

With the decline in consumption and the big gain in stocks, the Survey estimated the days' supply of domestic and imported crude held in this country at the close of April, figured at the April rate of consumption, to be 172 days. Days' supply since October is shown by months as follows:

October	118
November	115
December	119
January	136
February	148
March	146
April	172

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National Petroleum News
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California Co. Buys Into Beauvais Leases

By Special Correspondent

BILLINGS, MONT., May 26.—A one-half interest in the holdings of the Dox-Beauvais Oil Co. and Senator T. S. Hogan has been acquired by the Standard Oil Co. of California, it was announced here this week. This interest gives the Standard of California a large acreage in the Beauvais structure located on the Crow Indian reservation and to the southwest of the Soap Creek field.

The amount paid was not announced, but it was part cash, it is understood, the remainder to be taken out in future production from the leases taken over.

A number of oil operators and leading companies have looked with favor on this structure for nearly a year now, and some conservative oil men have predicted that with real development this summer, the region should develop into another Soap Creek field, with a real possibility of even better and larger production.

Kevin, Mont., up in the Sweetgrass Arch region of Toole county where the Campbell-Kevin well was reported in recently, reports that every indication points to a score or more tests being under way in the region within the next 30 days. The California Co., a subsidiary of the Standard Oil Co. of California, is said to be in the field already. The company has offices in Great Falls already and expects to open a branch at Kevin.

The Rainbow Oil Co., which was organized recently at Great Falls, expects to drill on 1120 acres of land out of the Lincoln permit near the Kevin well.

Lewistown is living in hopes of having natural gas for both domestic and industrial purposes. Recent indications as to gas production nearby indicate that such a hope may soon be fulfilled. The California Co.'s No. 1 test on the Armell's structure, 30 miles north of Lewistown, apparently is drilling itself in. When the open flow was first encountered and the well shut down for orders the flow was estimated at about two million cubic feet daily. However, this flow has been increasing constantly until now it is estimated at about 10,000,000 cubic feet. Application already has been made to pipe the gas to Lewistown.

Earl W. Husted, president of the American Refining Co. of Great Falls, Mont., was in Casper this week, asking for 1200 barrels daily of Salt Creek crude to be delivered to tank cars in Casper starting on August 1 of this year. This company is now constructing a plant at Great Falls which will have a capacity of 1200 barrels, and it probably will be completed about July 15.

HOUSTON, May 26.—Danciger Oil & Refining Co. has contracted jointly with M. Agress of Dallas for a core test to be made of prospective potash deposits at the juncture of Ector, Crane and Midland counties. Under the shot-core method of testing the equipment works on similar principle to the usual rotary drill, in which small chilled shot, acting as ball bearings and working in any gear, take the place of the usual type bits.

TULSA, May 26.—D. E. Buchanan, sales manager of the Chestnut & Smith Corp., returned here today from a trip through Iowa and Illinois.

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Oklahoma Production Increases; Bristow Holds Attention

(Continued from page 62)

This well had 60 feet of lime before encountering the pay. These two wells are the second and third to reach the pay since the first Dutcher sand well in the vicinity was drilled by Billingslea and Buell, and both of them are considerably larger than the discovery well. Another well will probably soon be added to this list, as the Bradstreet Oil Co. et al., are now on top of the Dutcher sand in their No. 1 Gladys Smith, also in Sec. 15, and it will be drilled in within the next few days.

In the Mid-West pool, south of Okemah, Okfuskee county, no developments of especial interest were recorded during the week. The well of the Oklavania Oil Co., in the NE¼ of the NE¼ of 11-10-9, which has been watched closely as the probable next well to reach the pay in this field, has been troubled with a cavey hole after having reached a depth of 3108 feet, and has had to set a liner on this account, which has delayed its drilling in. This is a west offset to the well of the Independent Oil & Gas Co.-E. Rogers Kemp well in the northwest corner of Sec. 12, and is also practically an offset to the south of the original well of the pool in Sec. 2, drilled by the Mid-West and Gulf Corp. The Independent-Kemp well is holding up at about 1200 barrels daily at four feet in sand found at 3118 feet. Another well nearing the sand in this locality is that of the Prairie Oil and Gas Co., No. 1 Russell in the SW ¼ of the SW¼ of 1-10-9, which is drilling at about 2900 feet, after having been held up some time with a fishing job.

In the Lyons pool, Okfuskee county, a well reminiscent of better times down there is the No. 4 Barnett of Robinson, Letcher et al., in the center of the east line of the SE¼ of the SW¼ of 24-11-11, which is making 1000 barrels at 10 feet in the deep sand topped at 2627 feet. This well had been held up for two months with a fishing job, during which time it made 150 barrels daily from the upper 2400-foot sand. It is the best well completed in the Lyons pool for some time, as 1000-barrel wells there have been few and far between lately.

In southern Oklahoma, the Graham field is still attracting attention, and apparently is going to develop into an important producing area. Another recent completion in this field is the Kirk Oil Co.-J. P. Hivick No. 1 Bennett, located in the southeast corner of the NE¼ of the NW¼ of 31-2S-2W, which is flowing by heads at the rate of about 500 barrels a day after having been drilled 32 feet into the sand topped at 2502 feet. This is the best well brought in in the field to date and brings the production of the field up to about 1000 barrels, most of which is coming from three wells. The deep sand in this pool was discovered several weeks ago in the Kirk-Graham Mineral Trust well on the Bennett farm, about one quarter of a mile northeast of the Kirk-Hivick well, and the sand in that well was found at 2640 feet. It was drilled to 2690 feet and had an initial production of 250 barrels. Although the formations encountered were similar in both these wells, operators of the Kirk-Hivick well now are of the opinion that they have picked up a new sand overlying the 2640-foot sand. The oil from the Kirk-Hivick well is of 35 gravity, and is being run by the Prairie Pipe Line Co. This oil is now getting the regular Mid-Continent price of $2, since the entry of the Prairie into the field, as mentioned some time ago. There are now eight wells drilling in the field, with a number of locations made and rigs building.

Another Well at Brock

In the Brock field, south of Ardmore, Carter county, the Amerada Petroleum Corp. has added another producing well to the field in its No. 1 Sallie Marris, located in the northwest corner of the SW¼ of the SE¼ of the SE¼ of 20-5S-1E. This well is flowing 170 barrels from two sands at 1360 to 1373 feet and 1419 to 1462 feet. The Westheimer-Daube No. 2 Fee in this field, located in the center of the south line of the S½ of the SW¼ of the NW¼ of Sec. 21, had a third showing of gas in sand drilled through at 1100 feet. This showing was estimated good for about one million feet, and the well is already making about 10 million feet from the two sands already passed through at 883 to 892 feet and 915 to 930 feet. This well is on the east edge of the pool, and is now drilling at 1230 feet. A derrick has been erected for J. E. Crosbie's test No. 1 First National Bank, in the southwest corner of the SE¼ of 16-5S-1E, located on top of a peak in the Criner hills, ¾ of a mile northeast of production, and this test will be watched with interest, as much argument has been going on as to whether the formations found in the producing area of the field will continue in the hills.

In Garvin county, the Magnolia Petroleum Co. has succeeded in shutting in its gasser on the Newberry farm, in the SW of the NW of the SE of 14-1N-3W. This has been blowing wild for six months. It was brought under control by drilling an offset 50 feet south, which found the gas sand at 1302 feet, and which was permitted to run open for a brief period, during which the pressure in the old well was diminished and it chocked itself in. It is believed the Magnolia people will build a rig over the old hole and drill deeper in search of the oil sand. The wild gasser has attracted statewide attention during its orgy, having formed a crater in its immediate vicinity which was continually filled with bubbling water resembling a miniature ocean.

In the Tonkawa field, Noble county, recent completions have brought the production of the pool up to about 9,000 barrels daily, divided as follows: Amerada Petroleum Corp., 1700 barrels from three wells; Southwestern Petroleum Co., 2650 barrels from two wells; Marland, 1800 barrels from two wells; Comar Oil Co., 2840 barrels from four wells; and White Eagle Oil & Refining Co., 30 barrels from one well.

Investigates Montana Field

WASHINGTON, May 26.—On confirmation of the discovery of oil near Kevin, Toole county, Montana, arrangements were made for engineers of the Winnett, Montana, office of the Bureau of Mines to go to Great Falls for the purpose of surveying the situation. There is a great deal of government land in the immediate vicinity of the discovered well, all of which is covered by permits, and some educational work will be necessary to acquaint operators with their relationship to the leasing supervision work of the Bureau of Mines.

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Montana Test To Be Memorial To Rattler

CASPER, WYO., May 26.—Because he stepped out of a motor car on top of a big rattlesnake, George Jenkinson decided to name the joint test of the Midwest, Mid-Northern, and Western States on the Woody structure, 20 miles southwest of Hardin, the "Rattlesnake Well." Jenkinson, accompanied by Engineer Sickler of the Mid-Northern and V. W. Shoemaker of the Western States, were out spotting a location. Jenkinson stepped out of the car and squarely on the head of a big yellow rattler.

Fortunately the rattler was not coiled to strike because it was too cold for him to move quickly, and he was killed with little difficulty. The Woody test will be between the Soap Creek field and Hardin.

Duchesne Test Standing

CASPER, WYO., May 26.—The Ute Petroleum and Utah Southern Oil companies' joint test on the Early permit, Cline anticline, six miles southwest of Duchesne, Utah is standing at a depth of 1658 feet, while waiting for 10-inch casing to arrive. This has been delayed in shipment because of the almost impassable condition of the roads.

A letter has been sent to the head offices of the Ute Petroleum Co. by J. H. Cline, discoverer of the Duchesne structures, in which he states that it is his opinion that the high quality of the oil found in the test around 1500 feet indicates the presence of a reservoir sand somewhere below the bottom of the present hole.

Royalties Exceed Millions

WASHINGTON, May 25.—Royalties accruing to the United States government in April from the production of oil and gas on leased public lands in Wyoming and California amounted to $1,009,007.86, according to reports of the Bureau of Mines to the General Land Office. Of this amount, $784,600 is credited to Wyoming and $224,400 to California. Net royalties accruing to the government to April 30, as the result of oil and gas production on public lands under the general leasing act of Feb. 25, 1920, amount to $4,650,286.81. Permits for prospecting for petroleum and natural gas on public lands up to the end of April totaled 7,328.

Oil Men Aid Flood Victims

SHREVEPORT, May 26.—More than $20,000 has been contributed through the Shreveport newspapers to the relief of Louisiana flood sufferers, and a considerable portion of it was given by citizens connected with the oil industry. Practically all employes of several of the main oil companies contributed, and also the officers. The two largest individual donations from the oil fraternity came from E. G. Palmer and J. E. Smitherman, who gave $500 each. They are pioneers of the Haynesville oil field.

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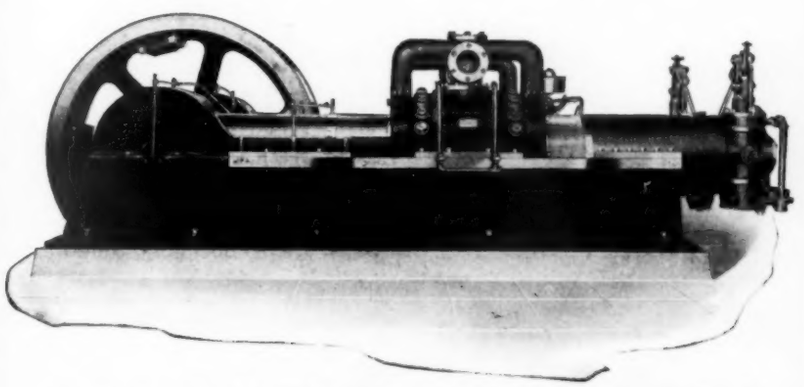

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Rain Delays Drilling In Northern Ohio

By Special Correspondent

FINDLAY, May 29.—Rain, which has been falling almost daily during the last several weeks in this section, has handicapped operators considerably and new work has been proceeding slowly on this account in the Lima field. Fields in the vicinity of wells have been miniature lakes for days at a time, making it impossible to move material. The last several days, however, have seen more sunshine and less rain and operators believe they will be able to push work without much interruption from now on. The new development work in the Lima field is being carried on a much larger scale than for several years and every operator is anxious to push his work as rapidly as possible.

Wood county, Ohio, which for the last month, has been the center of interest in the Lima field because of a number of better than average completions, is still to the fore, with a well reported this week, making 40 barrels at the outset. It is located in Plain township, and is owned by the Progressive Oil Co. It came in at 1628 feet.

A 10-barrel well was completed by J. B. Mayer and others in Marion township, Allen county, while a 5-barrel producer was obtained in Woodville township, Sandusky county by F. M. Mellyard and others. In the field near Elmore, Ottawa county, a 4-barrel well was brought in by Sherman and others.

The latest completion in the Roundhead field in Hardin county is barely a producer, an exceedingly light showing of oil being found. It is owned by H. T. Schmidt and others.

In the Centralia township, Marion county, Ill., field, a well starting off at 50 barrels was obtained by the Miller Mackey and Goin Co. The Eureka Oil & Gas Corp. has one that started at 20 barrels in the same field.

One Good Producer In Eastern Fields

By Special Correspondent

PARKERSBURG, W. VA., May 26. Gassers and dry holes made up the list in West Virginia the past week and in the deep sand territory of Ohio there was but one completion of fair size. Activity is in the decline, for with the determination of Independent producers in Pennsylvania and West Virginia to hold their oil for better market has come the falling off in drilling. There is no question that producers will be able to wait, for their policy has been one of retrenchment ever since the market slumped in 1921.

The best well of the deep sand territory in southeastern Ohio was completed and shot by the Arkansas Fuel Oil Co. on the W. H. Conger farm, in Sec. 12, Perry township, Licking county. This well, the fourth on the farm, made about 70 barrels.

The shallow Berea sand pool in Knox county is still active. Within the past month, there have been 22 completions with but one dry hole, these completions being in Harrison, Clay and Pike townships. These wells are generally to be rated at six to eight barrels initial, but are characterized by their very small decline rate.

In Plum township, Allegheny county, Pennsylvania, T. W. Phillips and others got another good producer on the Mallisee farm, this being No. 4 on the lease. It made better than 100 barrels the first 24 hours and about the same the second day. This is in the 100-foot sand.

Sinclair Is Hauling Material To Teapot

By Special Correspondent

CASPER, WYO., May 26.—A temporary camp already has been established by the Sinclair forces in 3-38-78, where a corps of engineers, geologists and other employes are to be quartered while at work on the Teapot dome. This indicates that the Mammoth Oil Co. or Sinclair interests are losing no time in getting started on tests in the Teapot structure. These quarters are to be followed by more permanent ones.

While everybody is talking, and politicians are complaining, about the injustice of the contract let by the federal government, the Sinclair forces are running lines, building shacks, dumping derrick material, driving stakes, and assembling drilling outfits for the immediate drilling of 20 tests.

Contract for building 20 derricks has been given to W. R. Weaver of Casper. The Keith Lumber Co. is supplying the lumber and the National Supply Co., the rig irons. Many trucks are hauling the material to the drilling sites.

It is stated here that never before has one company started 20 tests at once on an unproven structure. The barren waste of Teapot dome in a short time will be a forest of derricks, actually pounding away towards the oil bearing sands.

In working out the Teapot dome it is noted that Sinclair is surrounding himself with the old guard which stood at his side when he battled to his present position. T. W. White, his chief of engineers, who laid out the tank farm at Cushing, is in charge of the work in Wyoming. W. L. Connelly of Houston will be in charge of operations in the state. Connelly has been an able lieutenant for a number of years in the Sinclair organization.

No matter what the final outcome of the present fight may be politically, it is certain that the great wealth of Wyoming's rich oil and natural gas fields has been advertised throughout the world as it might never have been. It is also interesting to note that more men of real importance in the oil industry of the country have been in Casper within the last 30 days than have visited here in the preceding 30 months.

All Wyoming oil stocks have moved up to new high levels and there is general optimism regarding the future of all companies which are fortified with production in the Salt Creek field—all on the strength of the prospect of a wider market for Wyoming crudes and a better understanding of the value of the state's oil resources.

Receivership Ended On Haskell's Line

By Special Correspondent

SHREVEPORT, May 26.—The Homer and Haynesville oil fields are expected to be largely benefited by enlarged service planned for the Louisiana & Northwest railroad following the ending of its receivership and the restoration of the property to its owners. An order directing the road's restoration has been granted by United States Judge G. W. Jack of the western district of Louisiana. All property of the road except $150,000 for the liquidation of outstanding indebtedness is being delivered to the Charles N. Haskell interests by Ernest R. Bernstein of Shreveport, the receiver, under whose management the road has enjoyed phenomenal success.

This road has been an important factor in the development of the Haynesville oil field and the plans now in contemplation will enlarge its facilities sufficiently to care for other commodities produced in the tributary territory. It is reported that the owners are planning a branch line to run between Haynesville and Homer.

Good Completions In Paint Creek District

By Special Correspondent

LEXINGTON, KY., May 27.—Several completions of better than the usual type have been had in the Paint Creek uplift territory of Lawrence and Johnson counties which is currently the most active of any important Kentucky field.

In the Blaine district of Johnson county, Eastern Petroleum Corp.'s No. 7 C. C. Wright made 15 barrels; Union Gas & Oil Co.'s No. 8 James Skaggs made 35 barrels and the same company's No. 2 Joel Kelly was an 18-barrel well. Cumberland Petroleum Co.'s No. 7 Joseph Wheeler was rated at 30 barrels and the same company's No. 2 Marida Kelly in the same area but in Lawrence county made 8 barrels. The Union's No. 1 C. C. Holbrook in Lawrence county made 5 barrels.

Beaver Petroleum Co.'s No. 10 Steele heirs, in the Rocky Branch area of southwestern McCreery county, made 10 barrels.

Hits Carbon Black Plants

SHREVEPORT, LA., May 25.—Curbing of carbon black plants in the natural gas fields of Louisiana and thereby conserving the supply of gas so that it can be piped to centers of population in the state, is the purpose of a bill introduced by Senator E. Wayles Browne of Shreveport. The bill is almost an exact duplicate of the law enacted by the Wyoming legislature in 1919. A bitter fight is expected between the carbon black interests and cities and towns that want gas from the Monroe fields in which carbon plants are operating.

Coastal Area Of Colombia Shows Gains In Attention Of Operators

NEW YORK, May 26

By Lawrence E. Smith
STAFF REPRESENTATIVE

INCREASING activity in the northern part of Colombia east of the Gulf of Darien seems at this time to justify the belief of some operators in South America that a perhaps negligible quantity of oil from Colombia will enter the markets of this country within twelve months.

Taken with that part of Venezuela lying in the Maracaibo Basin, which is now the scene of some drilling by companies other than the Shell interests, which have had for several years production in the Meno Grande field averaging nearly 3,000 barrels daily in 1921, a fair intimation of the possibilities of northern South America will be afforded within the time mentioned. These areas mentioned are not comparable in any sense except in their accessibility.

Colombian development began in the interior. Parties sent out by American companies elected generally to make the trip up the Magdalena River, the principal waterway of that country. Seepage evidences were found in profusion and concessions were taken up with these as a factor in the selection of acreage, although not in all cases a controlling factor.

The history of development in the interior of Colombia has been told in various reports and a full summary was given in **National Petroleum News** (Nov. 23, 1921, page 23.) In a paper read before the conference on foreign oil possibilities of the American Institute of Mining & Metallurgical Engineers, Feb. 21 and 22, by Chester W. Washburne and K. G. White and published in **National Petroleum News** (March 1, page 48K) the country was briefly described from the standpoint of what drilling has demonstrated with reference to structural conditions. These articles bring up to about the first of this year the available information.

Since that time there has been a growth of interest in the northern coastal region. This has been inspired partly by the progress made in tests being drilled by large companies and partly because the cost of surmounting the natural obstacles in the way of rapid development in the interior are more appreciated. More mineral concessions are now being taken up along the coast and west of the Magdalena River.

South American Gulf Camp at San Andres. Houses are built high to get away from the many creeping residents of the country.

Drilling in Coastal Region

One of these tests is being drilled by the South American Gulf Oil Co., subsidiary of the Gulf Oil Corp. It is located a mile and a quarter south and a little west of the village of San Andres, in the Sinu River valley some 25 miles in from the coastal town of Amaya. This is down 800 feet and is on what is said to be a pronounced anticline with seepage evidence in the vicinity. The Gulf holds a concession of about 125,000 acres.

Considerable difficulty is being had with this hole and there was some doubt at latest reports whether it would be saved. Here an operating problem is encountered which is unique and which may make all drilling tedious. The hole started in lime and sandstones, very hard, and in this series of about 35 feet, only two to three feet was made in 24 hours. Fifteen and one-half inch casing was set at 525 feet and at 650 feet a series of cavey shales was struck. Twelve-inch was landed at 770 feet, but failed to hold and at last report the tools were buried under the cave-in.

A rotary is now on the way to the field and if the tools are recovered, the hole may be completed through the cavey shales with rotary. If they are not, a new hole will be started and will likely be drilled through the hard surface formation with cable tools, changed over to rotary for the shale stuff and switched back to cable tools after this is gone through.

This area is particularly attractive because production would be easy to market. There is no regular port of call near the Gulf concession but good harbors abound where tankers could easily be loaded. The distance inland and the gentle topography of the country, much of it devoted to agriculture, makes this Sinu River and northward area one of the best looking from the standpoint of relatively immediate commercial development.

North of the Gulf test near Palminto, the Anglo-Saxon Petroleum Co. (Shell) is making location for its first test. This acreage lies between the Gulf and that of the Latin America Petroleum Co. The latter is jointly owned by the Transcontinental Oil Co., of Pittsburgh and the Standard Oil Co. of California, with the latter directing the operations.

Latin America Drilling Two

The Latin America is drilling two tests on lands owned by the municipalities of El Carmen and San Jacinto. The El Carmen well is one and one-fourth miles due west of that town which lies about half-way between the Magdalena River and the Gulf of Morrosquillo. The San Jacinto well is eight miles northeast of the Carmen well. The latter was down 890 feet and the San Jacinto well 1560 feet on May 1. The elevation above sea level is 650 to 700 feet. No seepages are reported in this vicinity but excellent anticlinal folds and fossiliferous deposits in profusion have been found.

Although the Latin America came in from Zambrano on the Magdalena River to the east with equipment and material for the tests, the company holds acreage extending to the coast on the west and will lay a pipe line in that direction if production is found. Like the Gulf development, this would call

for a line 25 to 30 miles long to sea coast.

Latin America is using steel derricks in its tests while the Gulf's is wood. The timbers for the latter were taken from the United States as there are no trees in the part of the Sinu River valley where the test is being drilled of size sufficient to permit cutting the rig timbers on the ground, as is the case in the Magdalena River valley to the south and east.

North yet of the Latin America test and in what is known as the Cartagena-Barranquilla coastal region, lying west of the mouth of the Magdalena River, the Jenks Syndicate, an English company, is drilling on its ninth well. This is on the Kelly property near Puerto Colombia. One of these wells, 1800 feet deep is still pumping 10 barrels and another is making enough gas to fire the boiler for the test now drilling.

There has recently been considerable leasing activity in the general region of the tests enumerated, among the companies taking acreage being the Standard of California, Shell, Tropical Oil and Transcontinental.

Tropical Drilling Six

On the De Mares concession of the Tropical Oil Co. (International Petroleum Co., of Toronto) six wells are now being drilled and rigs built for several more. This property has the only commercially exploited wells in Colombia now, the three wells drilled by the Tropical while the Benedum-Trees interests controlled it producing oil which is refined at Barranca Bermeja, some 25 miles to the north of the producing wells. The output of the plant is marketed in Colombia and fuel oil is used to fire the boilers of boats which the Tropical operates on the Magdalena.

Some 60 miles north of the Tropical production and 20 miles northeast of the river town of Puerto Wilches, Colombia Syndicate (Guffey-Gillespie) is drilling its well known as No. 4. Nos. 1, 2, and 3 locations having been abandoned. About 50 miles north of the Colombia Syndicate well, Granada Oil Corp, started a well but work has been suspended for some time because of disputes over title.

Mid-Colombia Oil & Development Co. (Transcontinental) is drilling its Guataqui test, the extreme southern of development work thus far, and this is due for early completion.

These tests comprise the activity of note in the interior. A number of other companies hold concessions and more drilling will be in order within the next year, but for reasons previously set forth, the interior country will not be a factor for years.

The Texas Co., holding an option to purchase control of the Carib Syndicate and holding that option in the name of the Carib Co., is confining its activity to geological and title work on the properties of the Carib. The syndicate, which had acquired concessions in various parts of Colombia and some in Venezuela, was made up of several interests in which the Shell and the Doherty figured prominently.

The Barco concession of the Carib is situated far in the interior on the Colombian-Venezuelan boundary on the Catatumbo and De Oro rivers. Several wells were drilled and part of the acreage is regarded as proven, although the wells have as yet no outlet. Seepages are abundant on this property. One of the wells was rated at 1000 to 1500 barrels.

Outlet for this area logically is through Venezuela because of the mountains to the west but this territory also can be regarded as far from productivity.

Venezuelan Activity

Literally hundreds of concessions have been granted in Venezuela, these extending from the Lake Maracaibo basin along the northern coast. For present consideration, however, the Lake Maracaibo basin country is getting the attention. The Royal Dutch-Shell interests have heretofore been the only producers, their property being in the Mene Grande field east of the lake.

Recently the Standard Oil Co. of Venezuela was organized and this company has completed a well rated at 500 barrels of 20 Be. oil at a depth of slightly more than 800 feet. This is in the Mene Grande district on property held by the Maracaibo Oil Exploration Corp., which is headed by William Wallace Mein. This company holds about 22,000 acres in the district and the Standard is drilling certain of this for the joint account of the two. Other large tracts are held on both sides of the lake and the Standard has several tests under way. Maracaibo company will drill others for its own account.

Field Manager Shannon of the Latin American (Standard of California-Transcontinental)

This basin country has been given considerable publicity of late and the expectation of developing important production within the year is justified according to the reports made by a number of geologists and engineers who have worked in this country. It possesses the advantage ascribed to the coastal region of Colombia, that of accessibility. The lake is navigable for boats drawing 14 feet of water and the topography of the country lying within the basin will make pipeline construction fairly simple. The Venezuelan production is estimated to enter the markets of the United States in commercial quantity before that from Colombia does.

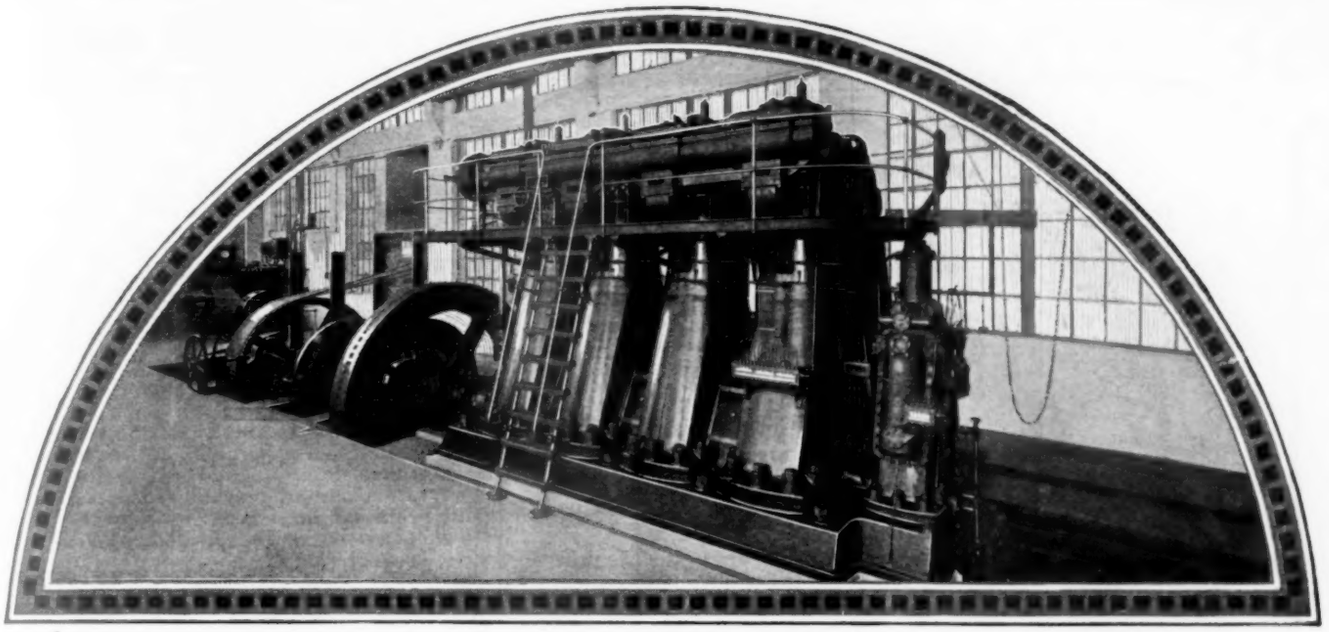
Elsewhere in South America there is little beyond the exploratory state with the exception of the International's production in Peru which has been under development for several years. The Leonard Exploration Co. has a large concession in the El Oriente district of Ecuador as has the Amazon Corp. Ltd., of Canada. Several tests are reported to be drilling in Ecuador, Argentine and Bolivia with important results confined to the Comodoro Rivadavia field of Argentine, which is government controlled.

Central America

In Costa Rica, the Sinclair Costa Rica Oil Co. is reported to have resumed drilling in its test inland from Limon, the definite location of which has never been revealed by the company, save that it is about 22 miles from Limon. This well had a gas blowout at 800 feet. Other locations have been made in this region.

In Panama, the Gulf holds a concession on the Pacific Coast of about 325,000 acres at Garachine, near Gulf of San Miguel and about 150 miles from Balboa, the Pacific terminal of the Panama Canal. Seepages are reported on this property, but no indication has been made regarding development.

South American Gulf's first test in Colombia located at San Andres



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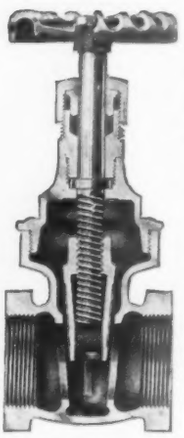

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Standard Takes Leases In Toole County, Mont.

By Special Correspondent

CASPER, WYO., May 26.—It is reported here that following the visit of officials of the Standard Oil Co. of California, the company took over leases on some 40,000 acres on different structures in Toole county, Mont., in the Sweetgrass Arch region. The company has opened offices in Great Falls, Mont., and probably will become active in development work in the northern part of the state of Montana this summer.

There is another report prevalent that the Mid-Northern Oil Co. has secured considerable acreage in the Sweetgrass Arch and that acreage of other interests has been taken over by this company on Big Elk dome, Wheatland county, Montana.

The California Co. has a strong gas flow in its No. 1 well at Armells, the pocket being tapped at about 1250 feet. Drilling is going ahead. This is the development which the company, subsidiary of the Standard of California, is doing on acreage of the Trans-Continental Oil Co. and is some 25 miles northeast of Lewiston in Fergus county.

The Frantz Corp. is reported to have a showing of oil on top of the third sand at Cat Creek, Fergus county, central Montana, in its test located on Sec. 26-15-30, in the Antelope Creek section of the district. If this proves to be a commercial producer, it will be important in that it adds an extension of the heretofore defined limits of the field, and undoubtedly will result in considerable deeper drilling operations.

Phillips Officer Dies

TULSA, May 26.—George T. Brown, vice-president and general counsel of the Waite Phillips Co., died May 15 at his home here after a week's illness. Mr. Brown, who was born in Illinois, had been a resident of Tulsa since 1905, and had been successful in the practice of law, specializing in oil litigation. In January, 1920, he gave up his private practice to devote all his time to the Waite Phillips interests, and upon the consolidation and incorporation of those interests a few weeks ago, he was elected one of the vice-presidents of the company.

Mr. Brown was a graduate of the University of Kansas, his family having removed to that state in 1881. At the time of his death he was president of the Tulsa County Bar Association. He was a member of the Christian Science church, a thirty-second degree Mason and an Elk.

His wife, one daughter, and one stepdaughter survive.

PORT ARTHUR, TEXAS, May 25.—F. C. Blanchard, 35, a workman at the Port Arthur plant of The Texas Co., fell into a boiler feed tank at the refinery one night early in the week and was drowned. The body was recovered upon draining the tank.

Use Of Calorized Tubes In Refining: Advantages And Economies

By Arthur V. Farr

VICE PRESIDENT, THE CALORIZING CO., PITTSBURGH

PITTSBURGH, May 25

THE big problems in oil refining have been solved in principle, but there are today many refinements to be worked out and costs may be materially reduced. Matters of temperatures and pressures remain to be improved. For successful results pressure stills must operate at temperatures of 700 to 750 degrees F. minimum in the still. That means that the steel containers must stand still higher temperatures. But here is the difficulty, at 850 degrees F. steel begins to lose its tensile strength and its ability to withstand pressure. It is clear, therefore, that in using ordinary steel great caution must be exercised to prevent overheating. Were it possible to use a material safely at higher temperatures, it is reasonable to assume that the yield of low-boiling fractions would be increased.

In the various methods of refining now in use and in various stages of development, there is a marked tendency towards increased temperatures and pressures. The increase in pressure from atmospheric to 100 pounds per square inch was one step, and from 100 to 150 pounds followed shortly and now pressures at 300 pounds and higher are being adopted. With increasing pressures, temperatures have, of course, increased proportionately. With temperatures up to 750 degrees F. steel or iron is satisfactory, but when the higher temperatures such as 1000 to 1400 degrees F. are encountered, the life of the metal is definitely limited and subject to progressive deterioration.

Tubes Need Attention

Tubes in pressure stills have been a source of constant attention. The still must be shut down at intervals for cleaning, inspection and repair. Any material deposited on the interior of the metal walls, must be removed to prevent metal failure. If, because of faulty cleaning or circulation, carbon or other deposit is allowed to cake on the inside of the tube, the heat from the outside cannot be conducted away with sufficient rapidity and a "hot patch" forms, which frequently results in a blister or the tube gives way altogether.

This condition in refineries using pressure stills is a definitely understood matter, and a means of getting a material to withstand this action more successfully than steel or iron at reasonable expense, has long been recognized as a vital need. The calorizing process has been introduced to the pressure still plant to meet this requirement. This process, the patents covering which are owned by the General Electric Co., was first used experimentally by one or two refineries in the west that had had unusual difficulty on account of tube failure. The calorizing for these first experiments unfortunately was not done to meet the requirements of the refiners and the further use for this purpose was for the time being retarded. When the requirements of the refiners were fully appreciated, however, and the tubes processed with this in view, results were obtained that were surprisingly satisfactory.

Life More Than Doubled

In one case of a refinery in California, regulation tubes did not last longer than 50 days in the hot zone and frequently failed within 30 days. Calorized steel tubes were placed in the hottest rows of several of the stills and put into continuous service for 130 days before failure. Upon examination, it was found the tube surfaces were in excellent condition and that failure had taken place along the weld. Thereupon, seamless drawn calorized steel tubes were put into service. Temperatures in this plant were not excessive, but there was corrosive action from the crudes, which, combined with a critical temperature of about 1200 degrees F., attacked the inside of the steel tubes and caused progressive deterioration. The calorized surfaces of the tubes not only resisted the heat action, but the corrosive action as well.

Fig. 1.—Section of 4-inch calorized seamless steel tube, etched and polished to show the penetration of the calorizing into the metal.

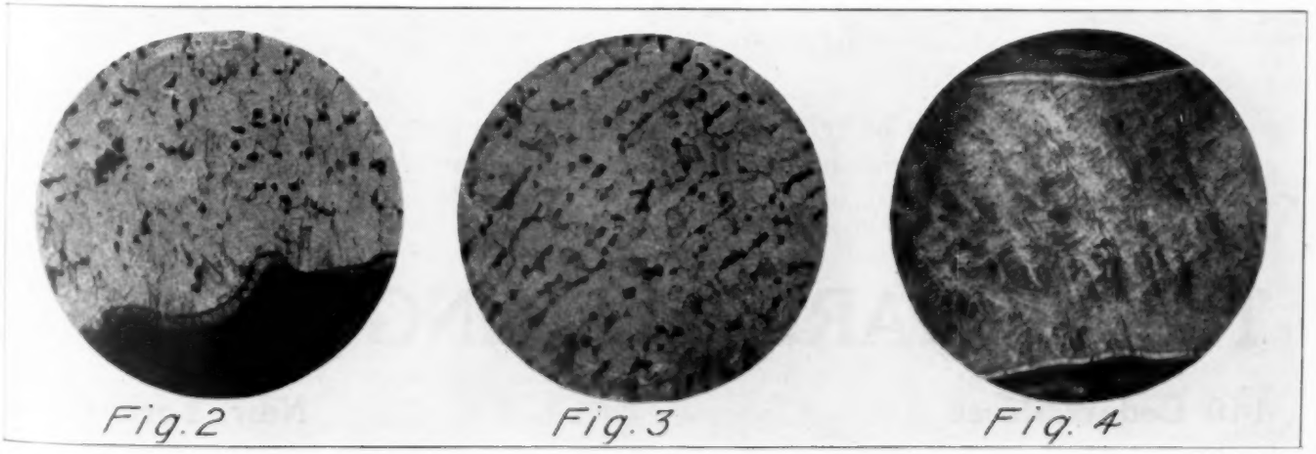
Calorizing is a process applied to materials already made, and serves the purpose of a protective coat. It is not a cast alloy, but a surface treatment, and consequently there is no difficulty in applying it to pipes, thin sections or small pieces.

Qualities of Coat

In considering a surface coating of this character, there are several essential qualities that such a coat must possess:

1. Coating should render material resistant to heat, abrasion and if possible, corrosion.
2. Structural strength of the material treated must be maintained.
3. Coating must be integral with the core or metal being protected.
4. Coating should not act as a heat insulator.

The calorizing process consists in placing the material, such as tubes, after being properly prepared, in a rotary retort and heating in a reducing atmosphere, the retort being filled with a mixture containing finely divided aluminum. The treatment, conducted at high temperature, infuses aluminum into the exposed portion of the metal to form a homogeneous aluminum al-



Figs. 2 and 3—Photomicrographs showing structure and cross-section of calorized tube after the crushing test. The Homogeneity of the alloy may be ascertained from illustrations. Mag. 100 diameters. Fig. 4—wrought iron pipe which shows the alloyed zones bounding the iron core. The treated portion adheres to the remainder of the material eliminating lines of cleavage. (Mag. 3.5 diameters)

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loy for a certain depth. This depth varies, according to the service requirements of the material, from a few thousandths of an inch to the permeation of the entire mass.

Aluminum Oxidizes

Protection against heat action is due to the oxidation of the exposed aluminum oxide. This oxide formed on the surface prevents the penetration of oxidizing gases into the metal. The aluminum under the oxide coat is alloyed with the steel or iron. Should the outer surface become injured, the protective surface renews itself by forming a new oxide coating. This aluminum oxide coat will protect the metal against heat action up to 1650 degrees F. almost indefinitely. With temperatures from 1650 to 1700 degrees F. material will last from five to 10 times as long as when untreated.

An oil refinery that has used calorized tubes experimentally for about a year's time operates at a temperature of approximately 1800 degrees F. The circulation of oil in the tubes is maintained at high velocity and heavy pressure. The normal life of steel tubes is 30 days and the tests to date indicate that the life of calorized tubes is six months.

It is a known fact that carbon does not adhere to aluminum surfaces. To use a homely illustration: an aluminum waffle iron is never greased because the batter does not stick to the aluminum. Similarly a calorized surface, which is essentially an aluminum impregnation, acts "greasy" towards carbon and hydrocarbons.

Upon examination of the calorized tubes in a Texas refinery, it was found that, at the end of each run, there was a deposit on the inside of approximately one thirty-second of an inch as compared with the normal average deposit of over one quarter inch on the plain tubes. The metallurgist of one large refinery tested calorized staybolts and nuts in a still and found that carbon did not adhere to them.

Cuts Down Carbon Deposits

A test run on calorized tubes in another refinery showed a carbon deposit but one-third as heavy as in uncalorized tubes. There was no soot or carbon deposited on the outside of the calorized tubes as compared with a very heavy deposit on the plain tubes. The advantages due to calorized tubes at this plant appear to be reduction of cleaning charges by two-thirds, and increased thermal efficiency of the calorized tube walls. Just how the benefits resulting from cleaner tubes due to calorizing are taken advantage of, differs in different refineries. In some cases the tubes are cleaned less frequently, in other cases the cleaning is as frequent but done in less time, a steam jet cleaner replacing the rotary cleaner for some operations.

As has been indicated, calorizing protects metals against burning or scaling action. In addition, the calorized surface is unaffected by sulphur dioxide, carbon monoxide and other furnace gases usually found in the products of combustion. It has been found that the action of oils containing corrosive ingredients such as sulphur, brine, and so on do not act nearly as rapidly on calorized surfaces as on plain metal. Its use for condensers and other places, usually subject to frequent replacement in the refinery, holds much promise.

In the case of one type of oil still, superheated steam is used as the heating medium to crack the oil. Calorized tubes are used in the superheater which is independently fired. The superheater consists of a series of calorized steel tubes set in a suitable furnace construction and steam at 1300 degrees F. and 300 pounds pressure is generated. Calorized pipe operates with complete success.

Base Metal Uninjured

In the calorizing process, aluminum alloys with the metal without injury to the base metal. The fact that burning and scaling action on the tube exteriors is minimized and that stills can be operated under higher temperatures and pressures, where calorized tubes are used, increases the factor of safety and reduces the fire hazard.

The process is done in such a way that the aluminum becomes an integral part and alloys with the base metal. On the outside is alumina, which is the protective coat; next comes aluminum, which upon exposure to heat oxidizes to alumina or penetrates into the base metal forming more alloy; next is the zone of aluminum in solution in the base metal, which possesses potential protection should the outer coat be destroyed or worn through, and on the inside is the steel or iron.

Scale or carbon deposit resists heat penetration to an extent not usually appreciated. One-hundredth of an inch of iron oxide, for instance, has the same insulating value as one inch of scale-free iron or steel. Calorized surfaces upon exposure to heat, form a uniform and constant film of aluminum oxide, which offers practically no increased resistance to heat, as compared with the conductivity of the metal when first put into service.

Tube Interior Calorized

Tubes are calorized in such a way that they can be successfully rolled into headers or screwed into return bends. Furthermore the tube interior is calorized the full length, even up to 23 feet in length.

The economy of the calorizing process is due to the fact that relatively inexpensive metal such as steel or iron is used. The continuous protective coating of aluminum does not raise the total expense of the material to nearly the extent that would be the case if the product were made entirely of alloys containing rare metals. Because calorizing is a surface treating process, the coat is based upon the exposed area. Size, shape and amount of material to be treated in a given length of time are factors also brought into consideration in determining the cost.

CASPER, WYO., May 26.—The second unit of the natural gasoline plant in the Salt Creek field, being built by the Midwest Refining Co., is nearly completed, and it is believed that it will be placed in operation by the first of July. When it is finished, the plant will have a capacity of 20,000,000 cubic feet of gas daily. This makes it the largest gasoline plant of its kind in the world.

Pipe Line Tax Hearing Announced For May 31

TULSA, May 25.—Notice of a hearing of arguments on the pipe line transportation tax before the bureau of internal revenue set for May 31 has been received here by Harry H. Smith, secretary of the Mid-Continent Oil & Gas Association.

Following a national conference on the tax held at Chicago on April 28, requests for a hearing were filed with the bureau by the American Petroleum Institute in co-operation with the Mid-Continent Oil & Gas Association and the Western Petroleum Refiners Association. All three organizations will be represented. They hope that the secretary and the attorney general may be present to hear the arguments as well as the commissioner of internal revenue.

Desire of the industry at this time chiefly is to have the government intervene in the pending suits on pipe line taxes so that the validity of the law may be tested. The element of dispute is whether oil transported by a refiner's own gathering lines to his own refinery may be taxed.

Will Build Gas Line From Carbon County

CASPER, WYO., May 26.—The Rocky Mountain Gas Co., a subsidiary of the Ohio Oil Co., is to start work soon on the construction of a pipe line from the Carbon county gas fields to Rawlins. The franchise for this work was granted in March this year. The Rocky Mountain company has made all arrangements with the Illinois Pipe Line Co. for part of the old 4-inch pipe line from Lost Soldier to the Midway pumping station, it is understood, and will use this to pipe the gas to Rawlins. The Illinois is replacing its 4-inch with 6-inch pipe to enable it to take care of the increased output of the Lost Soldier field.

In the northwestern part of the state, the Gordon Construction Co. is making good progress on ditching for the 14-inch gas pipe line of the Midwest-Wyoming Gas Co.'s 14-inch gas pipe line from Nowood to Greybull. This will connect the Golden Eagle and the Buffalo Basin natural gas fields. The company now is busily engaged in putting in the river crossings and it is understood that the loop will be completed by the middle of this summer.

Would Make Leasing Easier

SHREVEPORT, May 25.—Advices from Baton Rouge, where the Louisiana legislature is in session, state that Representative T. H. McEachern, of Homer, Claiborne parish, in which the Homer and Haynesville fields are situated, has introduced a bill allowing presumptive heirs of estates to lease lands for exploring for oil and gas. Mr. McEachern is reported to have stated that under existing laws a presumptive heir may sell property but cannot lease it, and that passage of his bill would enable the granting of such leases. Some tracts in Claiborne parish have not been explored because of the present law, it is claimed.

Something That Can't Be Sidetracked

Staff Special

HOUSTON, May 26.—The cryptic remark "shut down account of bandits" as referred to the International Petroleum Co.'s No. 1 Agua Nacida wildcat south of the Tuxpam river, in the Southern district of Mexico, promises to take rank with another famous line that appeared in a scout report in the early days of Central Texas development.

Back in the hey-day of Ranger development, when wildcatting was under way in miscellaneous counties outlying from what has since proved to be the general outlines of the black lime territory, the Texas-Midland Oil Co. was drilling a wildcat test 10 miles southwest of Baird, in Callahan county.

A flock of goats walked onto the derrick floor one night when the drilling crew had shut down and either fell or leaped into the 400-foot hole. That was the occasion for a scout's comment:

"Shut down, hole full of goats."

In Mexico, especially in that part of the Southern district where "wildcatting" is going ahead along the Tuxpam river, roving bands are currently giving drilling crews considerable trouble.

As between bandits in that region and goats in central Texas, one driller who knows both territories holds that wildcatting is "wild" all right and a pretty "woolly" occupation besides.

Begin Test Drilling In Area Of Seepages

By Special Correspondent

LOS ANGELES, May 25.—Although the knowledge of the possible existence of commercial oil in the Santa Monica mountains, in the southwest end of Los Angeles and less than two miles back from the sea coast line, has been known for eight years, it was not until the past week that earnest effort was started to prove up the reports made, at different times, by four geologists of known reputation, three of these reports being made for the State Mining Bureau and one for the United States Geological Survey.

The first development is being undertaken by the Santa Monica Petroleum & Development Co., a trust estate and close corporation. It has secured a lease on 2260 acres of homesteads over the entire area of which there exist well defined outcroppings of shale and sandstone heavily impregnated with oil with paraffin base. In several places actual oil seepages have been discovered, and again numerous fossils and shells are found in strata.

The company has established a camp and spudded in with a portable rig equipment capable of making at least 2500 feet of hole. The elevation is 1000 feet above sea level.

The delay in development of this promising territory has been through two causes: Inaccessibility and the heavy cost of road construction together with the refusal of cooperation and assistance to build a short-cut road on the part of the owners of the Malibu ranch, a strip of territory more than 20 miles long running along the ocean to the south of the territory. As it is, the developing company now goes some 10 miles out of its way, traverses a private road to the north and then comes back to the property.

Within the next three months it is reported, another company will start drilling on a 40-acre tract less than a half mile from where the pioneers are operating.

DENVER, COLO., May 25.—About $50,000 has been raised by San Luis Valley interests for the drilling of a deep test near Hooper, where these same interests have approximately 35,000 acres under lease. A standard rig has been erected and drilling should be started just as soon as the material can be assembled.

Association Presents Statement On Taxation

By Special Correspondent

SHREVEPORT, May 26.—The Mid-Continent Oil & Gas Association, through Joseph B. Elam, local secretary, has compiled and presented a brief and statement to the Louisiana legislature, now in session, revealing the actual conditions in the oil and gas industry of this state, as derived from authentic and authoritative sources. A number of taxation questions of particular concern to oil and gas interests have already been offered in the legislature and others are being suggested and contemplated.

This brief and statement of the association reveals the situation as regards the industry in Louisiana, in which there are now a 2 per cent severance tax on natural resources, a gasoline tax of one cent a gallon and other taxation, causing the oil and gas interests to call attention to the fact that they are being heavily taxed and should not be given additional burdens along this line, if anything, less burden. The brief and statement is expected to prove of interest in connection with a campaign under way to have the severance tax increased to 3 per cent and perhaps more.

Included in the statement is a summary of the costs of developing the present producing fields of Louisiana as showing the enormous expenditures which the oil industry makes to provide the needs of the country. This summary is as follows:

"In the Caddo field, 13 wells costing $260,000 (estimated) were drilled before a commercial producer was developed.

"In the Naborton (De Soto) field, 17 wells costing $340,000 (estimated) were drilled before a commercial producer was developed.

"In the Pelican (De Soto) district, 20 wells, costing $400,000 (estimated) have been drilled and one small producer developed.

"In the Spider (De Soto) district, 11 wells, costing $220,000 (estimated) have been drilled and they are all non-producers.

"In the Logansport (De Soto) field, seven wells costing $140,000 (estimated) have shown no commercial well.

"In the Grand Cane-Longstreet-Gloster-Benson (De Soto) area, 14 wells costing $280,000 (estimated) show no production.

"We have, therefore, chargeable to 'discovery,' in De Soto, $1,380,000.

"In the Homer (Claiborne) district, five wells costing $100,000 were drilled before a commercial producer was obtained.

"In the Haynesville (Claiborne) field, eight wells, representing expenditures of $311,000 (figures by Mr. Smitherman) were made before paying production was obtained.

"For Claiborne, we charge 'discovery' with $411,000.

"In the Bellevue (Bossier) district, 19 wells, costing $380,000 were drilled before a commercial producer was developed.

"In the Plain Dealing (Bossier) district we have 19 wells costing $380,000, with no producer.

"For Bossier, we charge 'discovery,' $760,000.

"In Webster parish, 23 wells costing $460,000 have failed to develop a commercial well.

"Pioneering in the oil and gas industry has the same history as pioneering in any other industry—for each new venture a greater or less period of failure that only unremitting effort can change to success. The price of experience must be paid and there is no escape from Nature's law of nothing for nothing. No bed of roses is provided for the organization attempting to discover a new field or to extend an old one.

"Of the 8300 or 8400 wells that have been drilled in Louisiana in search of oil and gas up to the close of 1921, over 2000 were dry holes and of the producers only 2700 odd oil wells and 300 odd gas wells remained in operation at that time—the rest have been abandoned."

SHREVEPORT, May 26.—The wind storm which swept the southwest hit the Shreveport oil territory on May 22 and blew down between 300 and 350 derricks, causing losses estimated at $500,000. The Gulf Refining Co. lost 40 rigs; Standard of Louisiana, 19; Gilliland Oil Co., 15; Louisiana Oil Refining Corp., 6. The Ohio Oil Co., with 20 derricks blown down, was the heaviest loser in the Haynesville field.

Did someone lend you this issue? See page 47.

REFINERY-TANK WAGON MARKETS

Gasoline And Gasoline

THE threatened investigation by a congressional committee of the advancing prices of gasoline had no effect on the course of prices at the refinery during the week. The price continued to strengthen at all refining centers, although the buying was a little off from the volume moving two weeks ago. As it is generally acknowledged that refinery prices of gasoline have gone about as high as they can and let the jobber live under the present tank wagon schedules, it is expected that there will be further tank wagon advances shortly the country over.

New Navy Gasoline Demanded For Export

The outstanding feature of the situation is the scarcity of new Navy gasoline. This did not become so apparent until the past week. Foreign demand for gasoline is increasing steadily and the foreign buyer will not take any product below new Navy specifications. The result is that the exporting companies having taken or contracted for all the 64-66 gasoline that can be turned out at Independent plants, are now heavily in the market for new Navy.

The output of new Navy is limited and the bidding for it by the exporting companies, who are reported in some cases to be paying as high as 19 cents a gallon for it, have driven the price up to the point where the jobber operating, say, in Standard of Indiana territory, cannot handle it without a loss under the present tank wagon price. The same is true in many other marketing territories. This means that there is not enough new Navy to go around; that this grade, which in many parts of the country had become sort of an unofficial standard among the Independent companies, is now unavailable for domestic use.

Jobbers Turning To Heavier Gasoline

In this situation the jobbers are forced in many parts of the country to turn to 56-58 gravity 450 end point stuff and even with this they are unable to make an adequate profit at the established tank wagon. It is this situation that has led Independent jobbers in some territories to take the initiative and raise the tank wagon price. In cases where this has been done the dominant marketing companies have followed the increase. It is likely that the practice may become more general, as the margin tightens.

Another important factor in connection with the "enormous stocks" of gasoline that the newspapers are disturbing the motorists about is that much of the gasoline in storage is not in its present shape, satisfactory motor fuel. A great part of the stocks along the eastern seaboard were made from Mexican crude and the gasoline is too heavy to meet competition until it is sweetened and volatilized by blending with natural gasoline.

Demand Drives Natural Gasoline Up

The supply of natural gasoline is limited and it is the demand for it for sweetening the gasoline made from Mexican and some of the other inferior crudes that has raised the price to its present level. The cost of blending the heavier gasoline with the compression or absorption product, at the present prices of those products is going to make the resulting gasoline more expensive to the consumer.

The oil industry should by no means allow the investigating committee, if there is one, to overlook these important facts.

Buying Slackens At North Texas Plant

Staff Special

FORT WORTH, May 27.—Domestic trading in the north Texas refinery market has slowed down during the past week. With the exception of buying of navy and 64-66 gravity gasoline for export the market has been unusually quiet. Prices on some products have eased away slightly as a result of the situation.

Wholesale refinery prices appear to be a little too high from the point of view of the jobber. He is finding it difficult to realize a profit under the present condition of the tank wagon structure. As a result, little inquiry is being made for immediate shipment of gasoline over the remainder of May. Buying for June has not reached any great proportions to date.

Blending materials are showing some weakness. The slowness of the movement of straight run products and the previous high prices of natural gasoline and naptha are assigned as causes. Greater supplies of blending materials are available now than a week ago. With demand falling off, it is believed that natural gasoline may be even more plentiful soon unless prices drop.

Kerosene has remained firm at the high prices commanded a week ago, ranging from 4 to 4½ cents. Stocks are well cleaned up and an even better position in the market is anticipated for kerosene.

Higher prices are being asked for fuel oil as compared with last week. The position of the product appears to be fairly strong under the new quotations. The forward movement is more sympathetic than anything else for although some of the larger consumers are making inquiry, no brisk trading is in progress.

Big Lub Order Moves From South Texas

Staff Special

HOUSTON, May 27.—No large sales affecting Gulf coastal lubricants have resulted since the recent contract of 430,000 gallons of 100 viscosity pale oil made by one of the leading Independents at 6 cents. Details were not made public further than that it constituted a domestic sale but the order is believed to be going into eastern territory and is said to be moving out within 60 days.

Jobbing demand continues relatively slow with the movement described as steady for quantities selling on basis normal to recent weeks.

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Refinery Markets On All Products

Pennsylvania, Oklahoma, North and South Texas, Louisiana, Arkansas

FOLLOWING are the average market prices on the more important petroleum products in cents per gallon f. o. b. in Oklahoma, Texas refinery and Pennsylvania. These are actual prices at which the bulk of each product is moving from the refineries at the present time. Anyone having knowledge of different prices which have obtained on any considerable quantity of any of the products mentioned will greatly favor us by advising us at once.

GASOLINE AND NAPTHA

PENNSYLVANIA	Prices May 29	Prices May 22	Prices May 1
50-52 Naptha	19 -19½	19½-19¾	
54 Naptha	19¾-20	-20½	17¾-18
58 Naptha	22 -22½	-22	19¾-20¼
60 Straight-run gasoline	23 -23½	22¾-23	20¼-20¾
62 Straight-run gasoline	-24	-24	-22
64 Straight-run gasoline	24¾-25	24½-24¾	23 -23½
68 Straight-run gasoline	-26	-26	24 -24½
68-70 Blend, 450 E. P.	21 -21½	20½-20¾	-19
60-62 Blend, 450 E. P.	21 -21½	20½-20¾	-19
62-64 Blend, 450 E. P.	21 -21½	20½-20¾	-19
66-68 Blend, 440 E. P.	21¼-21¾	-21	19¼-19½
68-70 Blend, 440 E. P.	21¼-21¾	-21	19¼-19½
68-70 Blend, 420 E. P.	-22	-21½	-19¾
OKLAHOMA			
48-50 460 E. P. naptha	16 -16¼	16½-16¾	14½-14¾
50-52 450 E. P.	17 -17¼	17 -17¼	15 -15¼
56-58 450 E. P.	17½-18	17½-18	15½-15¾
56-58 (New Navy), 437 E.P. 140 i. b. p.	18 -18¼	18 -18¼	15¾-16
58-60 (New Navy), 437 E.P. 140 i. b. p.	18½-18¾	18½-18¾	16 -16¼
60-62 400 E. P.	20¾-21	20½-21	17½-17¾
64-66 375 E. P.	21¼-21½	21¼-21¾	19½-19¾
68-70 350 E. P.	22¾-23	22¾-22	20 -20½
NORTH TEXAS			
48-50 450 E. P. naptha	15½-16	15½-16	
50-52 450 E. P. naptha	16 -16½	16 -16½	13 -13½
56-58 450 E. P.	18 -18½	18¼-18¾	15¼-15¾
58-60 440 E. P. gasoline	18¼-18¾	18½-19	15½-16
60-62 400 E. P. gasoline	20½-21	20½-21	17 -17½
64-66 390 E. P. gasoline	22 -22½	21½-22	19½-20
58-60 New Navy gasoline	18½-19	18¾-19¼	15¾-16¼
58-60 450 E. P. Blend	17½-18	17¾-18¼	
60-62 440 E. P.	17¾-18¼	18 -18½	
LOUISIANA-ARKANSAS			
51-53 460 E. P. Naptha	15 -15½	13 -15½	13½-14
56-58 450 E. P. Gasoline	18 -18½	18 -18½	15¼-15½
58-60 437 E. P. New Navy Gasoline	19 -19½	19 -19½	15¾-16¼
64-66 400 E. P. Gasoline	21½-22	21½-22	18¼-18½

NATURAL GASOLINE

OKLAHOMA			
Grade A, 72-76 under 375 E. P.	21¼-21¾	22 -22½	17 -17¼
Grade B, 76-80 375 E. P.	21¼-21¾	21¾-22¼	16¾-17
Grade C, 80-84 375 E. P.	21 -21½	21½-22	16¼-16¾
Grade D, 80-84, 330 E. P.	20¾-21¼	21¼-21¾	15¾-16
Grade E, 84-87, 330 E. P.	20½-21	21¼-21¾	15½-15¾
Grade F, 87-90 330 E. P.	20½-21	21 -21½	15½-15½
(Motor Natural Gasoline—Blends)			
Grade 1, 60-62 450 E. P i. b. p. 87	17½-17¾	17¾-17⅞	15¼-15½
Grade 2, 62-66 450 E. P. i. b. p. 80	17½-17¾	17¾-18	15¼-15½
Grade 3, 66-70 450 E. P. i. b. p. 70	17¾-18	18 -18¼	15¼-15½

BURNING OILS

PENNSYLVANIA			
45 Water White	6¾-6⅞	6¼-6½	5¼-5½
46 Water White	7½-7¾	7¼-7½	-6½
47 Water White	8 -8¾	8¼-8½	-7½
300 Burning Oils	7 -7½	-7	6½-7
OKLAHOMA			
41-43 Water White kerosene	4¾-4½	4¼-4½	3¼-3½
44-45 Water White kerosene	4¼-4¾	4½-4¾	3¾-3¾
45-47 Distillate 520 E. P.	8 -8½	8 -8½	6 -6½
46-48 Distillate 500 E. P.	11 -11¼	11 -11¼	7 -7½
NORTH TEXAS			
40-42 Prime White distillate	3½-4	3½-4	2½-3
41-43 Prime White Kerosene	3¾-4¼	3¾-4¼	2¾-3¼
41-43 Water White Kerosene	4 -4½	4 -4½	3 -3½
LOUISIANA-ARKANSAS			
41-43 Water White Kerosene	4 -4½	3¾-4	3¾-4

NEUTRAL OILS

PENNSYLVANIA	Prices May 29	Prices May 22	Prices May 1
(Viscous test 70)			
200 Vis. No. 3 Assoc. Filt.	25½-26	25 -25½	24 -24½
180 Vis. No. 3 Assoc. Filt.	23 -24	23 -23½	22 -23
150 Vis. No. 3 Assoc. Filt.	19 -20	-20	18 -19
(Non-Viscous)			
34 350-360 Flash	- 7½	7 - 7½	7 - 7½
36 Miners Neutrals 300-305 Flash	7 - 7½	- 7¼	6¼- 6¾
OKLAHOMA			
(Viscous test 100)			
70 Vis. at 100°F. No. 2 Color	4¾- 5¼	4¾- 5¼	4¾- 5¼
70 Vis. at 100°F. No. 2½-S Color	4½ 5	4½- 5	4½- 5
100 Vis. at 100°F. No. 2 Color	6½- 7	6½- 7	6 -6¾
100 Vis. at 100°F. No. 2½-S Color	5¾- 6¼	5¾- 6¼	5¾- 6¼
200 Vis. at 100°F. No. 3 Color	12½-13	12½-13	12 -12½
200 Vis. at 100°F. No. 3 Color	11½-12	11½-12	10¾-11¼
240 Vis. at 100°F. No. 3 Color	14½-15	14½-15	13¾-14½
240 Vis. at 100°F. No. 5 Color	13½-14	13½-14	13¼-13¾
280 Vis. at 100°F. No. 4 Color	16 -16½	16 -16½	15½-16
280 Vis. at 100°F. No. 6 Color	14½-15	14½-15	14½-15
300 Vis. at 100°F. No 6 Color	15½-16	15½-16	13½-14
SOUTH TEXAS			
Viscous test 100; cold test 0)			
100 Vis. No. 2 Color Unfilt. Pale	6 - 7	6 - 7	6 - 7
150 Vis. No. 2½ Color Unfilt. Pale	8½-10	8½-10	8½-10
200 Vis. No. 3 Color Unfilt. Pale	11 -13	11 -13	11 -13
300 Vis. No. 3 Color Unfilt. Pale	15 -16½	15 -16½	15 -16½
500 Vis. No. 3½ Color Unfilt. Pale	18½-21	18½-21	18½-21
750 Vis. No. 4 Color Unfilt. Pale	29½-30½	29½-30½	29½-30½
150 Vis. No. 1½ Color Filt. Pale	-23½	-23½	-23½
200 Vis. No. 2 Color Filt. Pale	-28½	-28½	-28½
300 Vis. No. 2 Color Filt. Pale	-33	-33	-33
500 Vis. No. 2½ Color Filt. Pale	30 -35½	30 -35½	30 -35½
750 Vis. No. 2½ Color Filt. Pale	39 -42	39 -42	39 -42
200 Vis. No. 5½ Color Red Oil	9½-11	9½-11	9½-11
300 Vis. No. 5½ Color Red Oil	13 -15	13 -15	13 -15
500 Vis. No. 6 Color Red Oil	16 -18	16 -18	16 -18
750 Vis. No. 6 Color Red Oil	28 -29	28 -29	28 -29

CYLINDER OILS

PENNSYLVANIA			
600 Steam Refined	13½-14	13 -13½	11 -12
635 Steam Refined	15 -16	15 -15½	14 -15
650 Steam Refined	17 -18	16½-17	16 -17
600 Flash	19 -20	21 -22	19½-20
600 Warren E.	20 -21	-20	19½-20
600 Oil City E.	18 -19	-19	17 -17½
600 Medium Filtered (D)	25 -26	-25½	24 -24½
Cold Test Stocks (bright filtered)	-38	-38	-38
Cold Test Stocks (dark filtered)	-34	-34	-34
Black Oil	- 7	6½- 7	5½- 6½
OKLAHOMA			
600 Bright Filtered	30 -32	30 -32	29 -31
600 Light Filtered Stock	26 -28	26 -28	25 -27
600 Steam Refined Olive Green	7 - 8	7 - 8	7 - 8
600 Steam Refined Dark Green	6½- 7	6½- 7	6 - 7
Black Oil (Summer)	5 - 5½	5 - 5½	5 - 5½

WAX

PENNSYLVANIA			
(Per Pound New York)			
122-124 White Crude Scale	- 2⅛	- 2⅛	- 2⅛
124-126 White Crude Scale	- 2⅛	- 2⅛	- 2⅛
OKLAHOMA			
(Per pound group 3)			
124-126 White Crude Scale	2 - 2⅛	2 - 2⅛	1¾- 2

FUEL OIL

PENNSYLVANIA			
36-40 Fuel Oil	4¾- 5	4¾- 5	4¾- 5
OKLAHOMA			
32-36 Gas Oil (Gal.)	3½- 3¼	3½- 3¼	2¾- 2⅞
24-26 Fuel Oil (bbl.)	.95-1 00	.90- .95	77½-82½
Fuel Oil, buyers cars (bbl.)	.95-1.00	.90- .95	77½-82½
Road Oil, 50-60% asphalt	1.20-1.30	1.20-1.25	1.00-1.10
Road Oil, 60-70% asphalt	1.25-1.35	1.30-1.35	1.20-1.25
NORTH TEXAS			
38-40 Straw Distillate	2½- 3	2½- 3	2½- 3
36-38 Gas Oil	2½- 2¾	2½- 2¾	2½- 2¾
32-36 Gas Oil (gal.)	2¼- 2½	2¼- 2½	2¼- 2½
24-26 Fuel, per bbl	.80- .90	.70- .80	.70- .80
26-30 Fuel, per bbl	.90-1.00	.75- .85	.75- .85
South Texas Fuel	1.15-1.25	1.10-1.25	1.10-1.25
LOUISIANA-ARKANSAS			
34-36 Gas Oil (Gal.)	-3 3¼	3 - 3¼	2¾ 3
24-26 Fuel Oil (Bbl.)	.80- .90	.80- .90	.80 .90

Freight Decision May Open Wider Sales Territory For Refineries

Staff Special

TULSA, May 27.

WITH the exception of natural gasoline which has shown considerable weakness during the past week, the general market structure in the Mid-Continent has not changed its position for more than a week and a half. Prices follow the same approximate range.

Opinion here is that prices on light products have advanced about as far as they can go under the present tank wagon structure prevailing in the trade territory served. It is not felt that further advances of any magnitude would permit the market to maintain a healthy appearance. A runaway market is considered as a possibility in view of the scarcity of Independent stocks of gasoline and a constantly growing demand.

But most refiners would deplore market situations which would run prices far above what the jobbers could pay. They are hopeful that the structure will remain firm in its present position with suitable advances in conformity with any general tank wagon increases.

In conformity with that view some refiners in Mid-Continent territory are making quotations for delivery over June. They are basing their quotations on present current prices with a provision that from three fourths to the entire gain in tank wagon advances be added to the sale price.

Most of the refiners offering such quotations are demanding that they receive the full benefit of any tank wagon change which may occur during the life of the contract.

While making such quotations they point out that the history of the market this spring has been that every advance has been promptly absorbed in full—or more than in full— by the refiner. They believe that the situation will continue as a seller's market throughout the motoring season and that jobber margins will not grow larger than those prevailing at present.

Probably a majority of the larger refineries are making no quotations for delivery over any part of June. The policy adopted at the opening of the spring of selling virtually the entire output of their plants on the spot market will be continued in force. Sales managers of such plants assert that their sales records have been much more satisfactory thus far by following closely the spot market.

Although buying recently has not been as voluminous as it was during the first half of the month it is generally conceded that all refiners have been moving every gallon of gasoline they have been willing to sell. The month will close without any additions to stocks as a result of the operations for the period. In many cases the stocks held have decreased to a certain extent.

An enlarged trade territory for the Mid-Continent refiner is seen for the summer as a result of the decision of the Interstate Commerce Commission in reducing all rates on a horizontal percentage basis. Traffic managers here are awaiting copies of the decision so that they may appreciate the full importance of the reduction and enable sales departments to outline their plan of action.

Since the 35 per cent increase was given on all rates it has been virtually impossible for plants in this territory to find customers in the vast consuming market east of the state of Indiana. It has been only in rare instances that conditions have arisen which have permitted shipments of most refined products to the east.

During the past 30 days some business has developed with jobbers in Pennsylvania and New York. Relatively small shipments have been made to the territory surrounding Buffalo.

It is the estimate of traffic representatives of some of the larger refineries in Group 3 that prior to the 35 per cent increase in freight rates as much as 25 per cent of the refined products of the Mid-Continent field were marketed in territory east of Indiana. Shortly after the decision was announced the movement dropped and refiners were forced to find an outlet for virtually their entire production in the middle west.

It is estimated that the movement after the rate increase was not in excess of two per cent of the production of Mid-Continent plants.

While the present rate decision will not place Group 3 on a basis which will permit it to compete fully with eastern plants, the traffic men believe that as much as 15 per cent of the output may be marketed in the east after July 1. They base their opinion on the fact that long haul rates will have an actually greater reduction in dollars and cents than the short haul rates although the actual percentage will be the same.

In territories where rates were advanced 25 per cent under the former order making a total of 125 per cent of the old rates, they are reduced 12.5 per cent of the old rate by the new order thus making a reduction of 10 per cent on the total. The same is true of the 35 per cent territory which was reduced 13.5 per cent or an even 10 per cent on the total.

It is not believed that the added trade territory and enlarged sales possibilities of Mid-Continent refineries will permit any decided advance in prices of gasoline in comparison with the tank wagon structure. The chief benefit looked for is a more stable tone to the market. Refiners believe that spotty trading and short sags may be eliminated with the larger territory looking to Group 3 for material. Domestic demand may be more steady from week to week with a more diversified territory and possibilities of different weather conditions prevailing at the same time in the wider district.

BULLETIN

TULSA, May 29.—At least one inquiry for upwards of 100,000 barrels of fuel oil for shipment over the next 90 days, together with the appearance of other buying interests, has served to further strengthen refined products prices in Oklahoma.

Attempts to purchase fuel at less than 95 cents have been futile today. The number of sales being made at $1 a barrel is growing. Natural gasoline prices showed a little more strength late today after having gone through a period of weakness when compression was selling at 20½ cents and below.

Export demand for new Navy gasoline appears to have a steady tone at present. Buying has been continuous for several weeks and considerable has moved to gulf ports. That element in the market has made Navy scarcer than other grades. Another reason, of course, is that a number of important refineries have ceased to market a Navy cut at all. They are devoting their entire attention to the production of 56-58 gravity, 450 end point.

Because they have required a grade of Navy somewhat better than the average product on the market, prices for export material have been higher in many cases than the general market. It is reported that some sales of export 58-60 gravity gasoline have been made at 19 cents.

While jobbers are in the market and out again quickly and only taking limited quantities, domestic movements are fairly brisk. Some bad weather in Illinois and Iowa has been instrumental in delaying purchases. During the past week a number of important jobbers circulated inquiries for motor fuel.

Natural Gasoline

With its limited selling field as compared with straight run products natural gasoline has been reacting quickly to market influences. After one or two short sags a week ago prices began to slide during the past few days. A full cent was cut from virtually every grade by Saturday. Prices have not yet reached the normal conditions under which the lower gravity grades of absorption with a high recovery usually sell at about 2 cents a gallon above the "wilder" grades of compression. Little more than a cent spread exists between grades A and F.

Manufacturers in some cases feel that prices have been too high in comparison with the remainder of the market. They look on the present movement as one of stabilization similar to that experienced by straight run gasoline prices more than a week ago.

Quotations for June delivery of natural gasoline are largely on the basis of market date of shipment. Some have taken a tank wagon basis while a number are making no quotations at all.

Kerosene

Recent advances enjoyed by kerosene have been held by that product during the past week. The tendency has been to stiffen prices even further. Movements have been satisfactory to the agricultural region but export demand has disappeared for the present.

Lubricating Oils

A second large sale of cylinder stocks for export was concluded a few days ago by the Barnsdall Refining Co. A shipment of 290,000 gallons will move to the terminals of the Union Petroleum Co. at Westwego during the first half of June. It is understood that the shipment is destined for Germany. The same company moved 7,000 barrels of cylinder stocks to export about a week ago. The present order is the third which has moved in trainload lots to export this year.

Fuel Oil

After a temporary weakness gas oil appears stronger again today with none available on the market at less than three and one-eighth cents per gallon. Fuel oil prices show a tendency to advance and more and more sales are recorded at $1 per barrel. Large orders have not been placed but smaller shipments are common.

Pennsylvania Products Show Advances; Buying Of Gasoline Slower For Week

Staff Special

CLEVELAND, May 29

THE most important features in the marketing situation at the eastern refining plants during the week was the continued increase in the demand for kerosene and the considerable strengthening prices for cylinder stocks. The demand for kerosene caused advancing prices and advances were scored by about every product on the list with the exception of fuel oil and bright stock.

The increasing strength of kerosene is in the face of declining demand for it for export, so the market must be caused almost entirely by the use of the product for tractor fuel.

All grades of gasoline, naptha and blends strengthened in price during the week, although the buying was rather slow as was the case the preceding week. Jobbers tanks are filled for a short time, this seems to indicate, and the jobbers will not be in the market heavily until the bottom of the tank is in sight. Considerably more gasoline was offered during the week than during the preceding week, owing perhaps to the fact that as the buying decreased some of the refiners had been running considerable motor fuel to storage.

Kerosene is moving currently to market and there are little or no stocks in the tanks at the refineries.

The viscous neutrals are moving in good volume at constantly strengthening prices, continuing the tendency that has prevailed during the past three or four weeks. The bright stocks, however, which are ingredients in motor oil used in larger quantity when the weather is hot than at present, failed to show any change in price, although some of the refiners found a somewhat improved demand during the week.

The steam cylinder stocks, however, especially the 600 flash grade, showed the greatest improvement that has been experienced in some months. The demand for this product is about as accurate an index as can be found for the general industrial situation because by far the larger part of the output goes to lubricate the machinery in mills and various manufacturing plants.

The non-viscous neutrals, however, which include spindle and other light oils, and are equally dependent on industrial activity for their market, failed to share the strength of the stocks, although their tendency was slightly upward. This in spite of the fact that there are comparatively small stocks at the eastern refineries because the refiners during the past few months when the market was negligible have not gone to the work and expense of turning out the non-viscous neutrals in any considerable volume, finding it more expedient to run them into the fuel oil for which there was a more or less satisfactory market while the demand for the non-viscous oils was almost non-existent.

Fuel oil moved fairly steadily during the week, although there was no very heavy demand there was sufficient to prevent the price from slipping. In fact the tendency of the price was upward rather than downward. It appears that the longer the coal strike lasts the stronger will be the market for fuel oil, although it seems apparent that a runaway market will be prevented and the increases will be gradual and natural from week to week.

The eastern refiners are looking forward to a good summer and there is nothing worrying them particularly, although they are hoping there will be no increase in the posted price of crude until the market for refined products gets a little stronger at least.

Kentucky

The gas oil market is strong at the Kentucky refineries, due to the fact that several companies are buying it for cracking. The demand for fuel oil is not particularly urgent right now but the refiners are not offering much for sale. Kerosene remains strong and the same is true of gasoline, although the buying of the latter is in a sort of a lull just now as is the case at other refining centers.

Some of the refiners are making contracts for the first half of June on gasoline, on a flat price basis but it is not likely that contracts for a longer period would be looked upon favorably by them.

Indiana Jobbers Can't Handle New Navy At Present Tank Wagon Price

Staff Special

CHICAGO, May 27.—The strong export demand for new navy gasoline has brought the exporting companies into the market for this grade so heavily that the price has reached the point where jobbers in Indiana territory cannot handle it at the present tank wagon price. They are turning generally to the 56-58 gravity product.

The talk around Chicago is that the exporting companies are paying as high as 19 cents for new navy while 56-58 gasoline is quoted at from 17¾ to 18¼.

Domestic grades of gasoline were off a cent a gollon for two days early in the week, but regained their strength by Wednesday and orders for June delivery were coming in large numbers from jobbers in this territory on Friday and Saturday. The slackening of demand earlier in the week is easily accounted for. Rain slowed up jobbers sales and gave visions of a wet week-end and Decoration Day. There had been a prevalent opinion among jobbers for several days that gasoline had reached its limit and inasmuch as some of them were buying on the spot market and operating at a loss, it did not require a big rain to persuade them that they had enough gasoline to last a few days.

Inquiries from the jobbing trade the latter part of the week showed that if the distributing branch of the industry ever had an idea that a government investigation would cause a backslide in the refinery price, they soon lost that idea. It is pretty generally accepted in the industry now that much of the gasoline which figures show to be in storage is not real motor fuel. It has yet to be sweetened with a little natural gasoline which is none too abundant.

The demand for kerosene for use in tractors, which strengthened somewhat last week eased off during the week just closed, due to two things in all probability. The plowing season is drawing to a close and a renewed kerosene demand can not be expected to be very strong before harvesting time.

Furthermore, the rain last week laid up the tractors. During the latter part of this week 4¼-4¾ was an average quotation. Most marketers were quoting gas oil close around 3¼ cents, and the generally credited rumor had it that Standard of Indiana's needs for cracking were supplied for a month in advance.

Fuel oil keeps the trade guessing in this section. The coal situation is having considerable influence on the fuel oil market. Some conversions of heating devices in large industries have been made from coal to oil, notably the meat business. Packers ordinarily have their furnaces arranged to change from coal to oil with minimum loss of time, and whether any large number of them have actually begun to use oil, many of them have decided to wait no longer on a settlement of the coal question and are laying in a store of oil. Most of them are asking spot prices but some have inquired about contracts over a period.

Brick and steel and other basic supplies of the building trade were among the first to come into the market for fuel oil. Many of them started up from inactivity on fuel oil. During the past week several implement manufacturers have reappeared as fuel oil buyers. Reopening of plow and harvester works is a direct index to the farmer's pocketbook, and in this connection it is worth mention that Iowa banks are reported to be liquidating a large amount of their past-due paper.

Although strength was shown in the fuel oil market over the week, it was manifested rather in the volume changing hands than in the price.

A price of 90-95 cents is very conservative, in view of the large variety of fuel oils and the wide range ordinarily in effect here. A considerable amount of fuel was sold as high as $1 a barrel.

Rice Growers Using Fuel Oil

STUTTGART, ARK., May 27.—The rice growers territory of Arkansas is becoming an important user of fuel and gas oils according to M. E. Massie, formerly salesman for the Transcontinental Oil Co. in Arkansas, who is now connected with the new Arkla Petroleum Co. Thus far this year more than 2,000,000 gallons of gas and fuel oil have been distributed by the company in the rice territory.

WASHINGTON, May 26.—The German government ended its control of light oil, crude benzol and related products April 1, according to reports to the Department of Commerce.

Kerosene Strengthens Position In La.-Ark.

Staff Special

SHREVEPORT, May 27.—Kerosene furnished the feature of the northern Louisiana and Arkansas refinery market during the past week. Responding to the increased tractor demand from the corn belt and to some export buying, the price advanced approximately three-quarters of a cent per gallon. Current sales are being made at between 4 and 4½ cents for 41-43 water white.

Other products on the market appear to be in about as good a position as they can reach under present retail conditions. Naptha and gasolines have remained steady at prices prevailing a week ago. Domestic buying has been fair while export buyers have displayed even more eagerness for 64-66 and new Navy gasoline.

Steel mills of the central west have been good buyers of fuel oil during the past week. Storage appears to be under accumulation at some of the plants in preparation for greater use in the future when prices may be higher than at present.

Standard Of Nebraska Reduces Tank Wagon

OMAHA, NEB., May 29.—Effective May 20 Standard of Nebraska reduced the tank wagon price of gasoline one-half cent at Omaha. In some sections of eastern Nebraska the decline varied from one fourth to one-half cent. No change has been made in western Nebraska.

* * *

DENVER, May 27.—Continental Oil Co. effective May 24 advanced the tank wagon and service station price of gasoline 1 cent at Albuquerque, N. M. No change was made in kerosene.

Petroleum Imports

Figures compiled by the American Petroleum Institute show the imports of crude and refined oils into the United States for the weeks ended May 20 and 13, were in barrels of 42 U. S. gallons:

	Week Ended May 20	Week Ended May 13
Atlantic Ports		
Baltimore	481,867	201,000
Boston	156,000	156,000
New York	580,000	595,500
Philadelphia	214,000	273,500
Others	258,190	66,000
Total	1,690,057	1,292,000
Daily average	241,437	184,571
Gulf Ports		
Galveston district	218,000	317,000
New Orleans and Baton Rouge	460,000	534,209
Port Arthur and Sabine district	692,000	730,000
Tampa	15,000	15,000
Total	1,385,000	1,596,200
Daily average	197,857	228,029
All U. S. Ports		
Total	3,075,057	2,888,200
Daily average	439,294	412,600

Tank Wagon, Service Station Markets
Gasoline and Kerosene

BELOW are given in cents a gallon service station and tank wagon quotations on gasoline and tank wagon quotation for kerosene, as quoted by the Standard Oil Companies, the points at which prices are given being arranged by Standard Oil marketing districts. By tank wagon price is meant the price to reselling agents and not the price from the tank wagon to consumers.

S. O. NEW JERSEY DISTRICT

	Gasoline T.W. May 29	Gasoline S.S. May 29	Oil T.W. May 29
Atlantic City, N. J.	26	28	11.5
Newark, N. J.	26	28	11.5
Annapolis, Md.	26	28	11.5
Baltimore, Md.	25	27	10.5
Cumberland, Md.	26.5	28.5	11.5
Washington, D. C.	25.5	27.5	11
Danville, Va.	27	29	13
Norfolk, Va.	26	28	11
Richmond, Va.	26	28	11
Roanoke, Va.	27	29	13.5
Petersburg, Va.	27	29	12
Charleston, W. Va.	25.5	27.5	11
Clarksburg, W. Va.	26.5	28.5	11.5
Keyser, W. Va.	26.5	28.5	11.5
Parkersburg, W. Va.	24.5	26.5	9.5
Wheeling, W. Va.	25.5	27.5	11
Charlotte, North Carolina*	27.5	29.5	13
Hickory, N. C.	28	30	13.5
High Point, N. C.	28	30	13
Mt. Airy, N. C.	28	30	13.5
Salisbury, N. C.	28	30	13.5
Charleston, S. Carolina*	25.5	27.5	10
Columbia, S. C.	27.5	29.5	12

S. O. NEW YORK DISTRICT

†New York, N. Y.	27	29	13
Albany, N. Y.	24	26	14
Buffalo, N. Y.	23	25	14
Rochester, N. Y.	23	25	11
Syracuse, N. Y.	23	25	14
Boston, Mass.	27	29	13

†Note—Prices in Steel Barrels.

ATLANTIC REFINING DISTRICT

Pittsburgh, Pennsylvania*	26	29	14
Philadelphia, Pa.	26	29	14
Dover, Del.	26	29	14
Wilmington, Del.	26	29	14
Providence, R. I.	27	30	13
Springfield, Mass.	27	29	14
Worcester, Mass.	27	30	14
Hartford, Connecticut*	27	30	14
New Haven, Conn.	25	28	13

Note—The five New England towns named above are the principal Marketing points in Atlantic Refining Company's New England territory. S. O. New York also markets at these points.

S. O. OHIO DISTRICT

Cleveland, Ohio	23	25	13

Note—Tank wagon markets at all points in Ohio are the same as for Cleveland.

S. O. KENTUCKY DISTRICT

Lexington, Kentucky*	25	27	12
Louisville, Ky.	24	26	11
Covington, Ky.	24	26	13.5
Jackson, Mississippi*	24.5	26.5	10
Natches, Miss.	25	27	11
Vicksburg, Miss.	25	27	11
Birmingham, Alabama*	24	26	13
Mobile, Ala.	23	25	12.5
Montgomery, Ala.	25	27	14
Atlanta, Georgia*	27	29	14
Augusta, Ga.	26	28	14
Macon, Ga.	26	28	14
Savannah, Ga.	24	26	12
Jacksonville, Fla.	25	25	12
Miami, Florida*	26	28	15
Tampa, Fla.	23	25	12

S. O. LOUISIANA DISTRICT

Camden, Arkansas*	25	28	13
Little Rock, Ark.	25	28	13
Alexandria, Louisana*	24	27	12
Baton Rouge, La.	23.5	26.5	10.5
Lake Charles, La.	25.5	28.5	12.5
New Orleans, La.	24.5	27.5	11
Shreveport, La.	23	26	10
Bristol, Tenn.	27	30	13.5
Chattanooga, Tenn.	26	29	14.5
Knoxville, Tenn.	26.5	29.5	15
Nashville, Tenn.	25	28	13
Memphis, Tenn.	24.5	27.5	12.5

MAGNOLIA PETROLEUM DISTRICT

	Gasoline T.W. May 29	Gasoline S.S. May 29	Oil T.W. May 29
Muskogee, Ok.	22	25	11
Oklahoma City, Ok.	22	25	9
Tulsa, Ok.	22	25	10
Pine Bluff, Arkansas*	25	28	13
Fort Smith, Ark.	25	28	13
Little Rock, Ark.	23	25	13
Texarkana, Texas	23	26	12
Amarillo, Texas	23	25	13
Dallas, Texas	23	25	12
El Paso, Texas	23	26	13
Fort Worth, Texas	23	25	10
Galveston, Texas	23	25	12
Houston, Texas	23	25	12
San Antonio, Texas	23	25	12

S. O. INDIANA DISTRICT

Chicago, Ill.	22	24	11.5
East St. Louis, Ill.	20.45	22.7	11.1
Evansville, Ind.	22.6	24.6	12
Indianapolis, Ind.	22.8	24.8	12.2
Fort Wayne, Ind.	23	25	12.4
South Bend, Ind.	23	25	12.5
Bay City, Mich.	23.5	25.5	12.6
Grand Rapids, Mich.	23.3	25.3	12.4
Detroit, Mich.	23.4	25.4	12.5
Battle Creek, Mich.	23.11	25.11	12.2
St. Louis, Mo.	22.2	24.5	11.2
Kansas City, Mo.	21.5	23.5	10.5
Topeka, Kansas	22.4	24.4	11.4
Wichita, Kansas	22.3	24.3	11.3
Des Moines, Ia.	23.4	25.4	12.7
Keokuk, Ia.	23.4	25.4	12.7
Sioux City, Ia.	23	25	12.5
La Crosse, Wis.	24	26	13.1
Milwaukee, Wis.	22.7	24.7	11.8
Madison, Wis.	23.9	24.9	12
Minneapolis, Minnesota*	23.7	25.7	13
Pipestone, Minn.	23.7	25.7	12.9
Aberdeen, South Dakota*	25.5	27.5	13.5
Sioux Falls, S. D.	24.9	26.9	12.9
Bismarck, N. D.	28.1	30.1	16.3
Fargo, N. D.	26.5	28.5	14.7
Grand Forks, N. D.	26.8	28.8	15
Minot, N. D.	28.8	30.8	17
Bartlesville, Ok.	21.5	23.5	10.4

S. O. NEBRASKA DISTRICT

Crawford, Neb.	20.5	21.5	13.75
Omaha, Neb.	21.5	23.5	12.5

CONTINENTAL OIL DISTRICT

Denver, Colorado*	25	27	15
Glenwood Springs, Colo.	30	†	20
Pueblo, Colo.	25	27	15
Basin, Wyo.	24	†	14.5
Casper, Wyo.	21.5	23.5	12.5
Cheyenne, Wyo.	24	26	14
Cody, Wyo.	26	†	16.5
Lander, Wyo.	24	†	15
Billings, Montana*	27.5	29.5	16.5
Butte, Mont.	24.5	26.5	18.5
Great Falls, Mont.	29.5	31.5	18.5
Helena, Mont.	29.5	31.5	18.5
Miles City, Mont.	29.5	31.5	18.5
Ogden, Utah	28	30	18.5
Salt Lake City, Utah	28	30	17.5
Boise, Idaho	28.5	30.5	20
Albuquerque, New Mexico*	28	30	16

†Indicates points at which Continental Oil Co. Maintains no service stations in Wyoming.

S. O. CALIFORNIA DISTRICT

Phoenix, Arizona*	26.5	28.5	21
Los Angeles, Cal.	21	23	14.5
Fresno, Cal.	21.5	23.5	17
San Francisco, Cal.	21	23	14.5
Reno, Nev.	25	27	18.5
Portland, Oregon*	24	26	15.5
Seattle, Washington*	23	25	15.5
Spokane, Wash.	27	29	20
Tacoma, Wash.	23	25	15.5

*Note—Besides the inspection fees collected from oil marketers, which vary from one eighth of a cent to 1 cent and a half a gallon in different states, 18 states levy an additional tax on gasoline, usually for road purposes. In Oregon, New Mexico and South Carolina the tax is 2 cents a gallon. It is 1 cent a gallon in Arizona, Arkansas, Colorado, Florida, Georgia, Alabama, Kentucky, Montana, Minnesota, Mississippi, North Carolina, South Dakota and Washington. It is included in the tank wagon price in those states. In Pennsylvania, Connecticut and Louisiana the 1 cent road tax is collected separately.

Lub Export Orders Drop; Gasoline Shipments Increase; Kerosene Slow

By Special Correspondent

NEW YORK, May 27

THERE was a decided decrease in the number of export orders for lubricating oils, but business in gasoline showed a marked improvement, and prices manifested a strong upward tendency. Sterling exchange has been holding up at around $4.45 for the past week and exchange authorities look for higher rates shortly. Therefore oil exporters are very much encouraged by the outlook.

While some factors report a better movement in kerosene, this improvement is by no means general. The majority of holders report a quiet market with foreign inquiries more conservative.

It is generally expected that by June 15 there will be further substantial gains in the export price of gasoline; in fact, numerous local sellers now entertain ideas considerably above those quoted by the Standard companies. In the case of new navy, the Standard interests are quoting 20 cents but leading Independents insist there is nothing available at this level. On the other hand, there is less talk of the possibility of an advance in kerosene. Prices are generally reported easier and a few bearishly inclined observers talk of declines in the near future. Light fuel oils have gone up another half cent, but no really important changes in bunker or gas oil quotations have come to the surface in some time.

While bulk kerosene is not moving heavily, there is fair quantity of cased goods moving into the Far East. One export organization reported the sale of 45,000 cases at present market prices but this was the only turnover of consequence reported during the week.

The demand for barreled oil in general, seems to be giving way to bulk goods regardless of the numerous inquiries and small sales reported. The average foreign buyer feels that it is to his advantage to barrel the oil abroad where labor and cooperage are far below the American level. This is particularly true of the northern European countries, but English buyers are still purchasing barreled oil in fair volume.

A canvass of the smaller exporters, last week, divulged a marked improvement in sentiment. Many truly feel that the coming month will find the industry in general on much firmer legs than it has been at any time since the beginning of the depression. While orders are by no means large, the inquiries seem to be seeping through to the smaller exporters, and while the big refiners are still getting the lion's share of the foreign business, there are more contracts over the next few months being closed, as many European buyers feel that they can secure better prices by going direct to the smaller consumers. Here and there, agents of foreign consumers are encountered, and in many instances, these foreign consumers never before personally represented in this country, but purchased their oil from the various distributing stations of the large American refiners located in Europe..

In some instances, the larger refiners are reported to have been negotiating for fair-sized purchases of some of the scarcer oils, from the smaller holders. There have been no substantial price changes in any direction, but upward revisions shortly in some of the lubricants, gasoline and bunker oil would not surprise the trade.

Gasoline and Kerosene

No less than three cargo sales of gasoline were reported last week. Two of these sales were of 64 gravity and the other for new navy. In each instance, the quantity was 42,000 barrels. Gasoline export prices were very strong, and regardless of the talk of an investigation, all indications point toward substantial gains. Several of the leading refiners are asking around 1 cent per gallon higher than the Standard companies are quoting.

In bulk, delivered New York, the asking price of new navy is held at around 23 cents and apparently the distributing element is getting this price. Cased gasoline is still moving steadily. The large Far Eastern buyers are looking around the market, and with persistent talk of possibility of further gains during the next few days, quite a few who would otherwise have withheld orders, have come through with fair-sized demands. Stocks of gasoline in general are not particularly heavy in this locality just now, regardless of the reports that a month or so ago they were the largest on record.

Kerosene seems to be something of a puzzle. In some quarters a good cased business is apparently going on, sales having been reported to Far Eastern buyers of 50,000 cases. However, there is not much oil being moved as far as could be learned, although there may be some going abroad on consignment that has not come to light. Refiners ideas seem to be varying a little more than a week ago, and while there has been talk of an advance during the near future, there also have been rumors current that leading refiners are considering cutting prices soon. This state of affairs has not been conducive to heavy buying. No bulk sales to speak of came to light during the entire period. For 45-150 bulk delivered New York the asking price was largly nominal around 7½ cents per gallon.

Bunker and Gas Oils

Light fuel oils were boosted 1 cent by one of the leading refiners. This factor is now asking 5 cents for 36-40 at the refinery. Export demand for bunker oil is still disappointing and sales in most instances have been confined to a few thousand barrels here and there, no cargo turnovers having come to the surface. The f. a. s. New York price is still held at $1.26½ per barrel and rumors that the large refiners will advance prices soon, continue. On the other hand, gas oil has been moving more freely and one cargo sale of 63,000 barrels at around 3¾ cents gulf, was reported. It is also said that negotiations are going on for a similar sale at the same price. It was rumored that an English buyer is behind the purchases.

Lubricants

Small parcel movements were fairly numerous, but only one sale of consequence came to the surface. This sale included 35,000 barrels to Europe. The majority of foreign buyers seem unwilling to pay present prices, and are inclined to believe that there will be no substantial gains. Hence the waiting attitude. For 600 steam refined the asking price, in barrels New York is still held at 19½ cents per gallon. Spindle oils have not changed nor have there been any revisions of consequence in the red oils in general.

Waxes are quiet. Export demand has been spasmodic and generally disappointing. Fully refined grades are quite plentiful with 122-124 A. m. p. available at 3¼ cents per pound New York.

Petrolatums and medicinal oils are unchanged.

Tankers

There have not been any important changes in the marine schedules of the leading companies for several weeks. It is reported that Sinclair is running 16 of its 17 ships while The Texas Company still is operating 18 vessels, its entire fleet. Both S. O. N. Y. and S. O. N. J. schedules remained unchanged while Tidewater is operating four large tankers.

New York Market

The following represent prices quoted by eastern seaboard Independent refiners on products which are manufactured almost entirely from Mexican crude transported from Tampico to the refinery by tanker. These products are being sold to an increasing extent to jobbers in New York territory.

	May 29
*Gasoline (New Navy) gal.	22¾
‡Bunker oil (F.A.S. New York) bbl	1.26½
Gas Oil (36-40 refinery) gal.	4½
Kerosene, 45-150 W. W. Bulk Del., N. Y. nom.	.07½
Cylinder, 600 S. R. Bbl. N. Y.	20

*Delivered
‡Nominal

Export Markets

The following export quotations are those of the New York Produce Exchange, which are furnished by the export departments of the Standard of New Jersey and the Tide Water Oil Companies.

Illuminating Oils

Quotations are based on the following quotations: Bulk, tank, steamers, barrels; cargo lots, about 30,000 barrels; cases cargo lots averaging about 100,000 cases. Quotations are for standard white 110 flash test.
S. O. N. J.

	May 29	May 22
Bulk, gal., Bayonne	6.50	6.50
Barrels, gal., Bayonne, cargo	12.50	12.50
Cases gal. Bayonne	16.00	16.00

Prices for water white oil (150 test) are 1 cent higher than those for standard white.

GASOLINE-NAPTHA
(Cents per Gallon)

Standard New Jersey, f. o. b. Bayonne

U. S. Navy, bulk	20.00	19.00
U. S. Navy, cases	33.25	32.25
Export grade, bulk	22.00	21.00
63-66 deg. bulk	25.00	24.00
66-68 deg. bulk	26.00	25.00

Tide Water Oil Company
(f. o. b. Bayonne)

59-61 deg. bulk	21.00	20.00
59-61 deg. cases	33.25	32.25
Export grade, Navy Specifications, bulk	20.00	19.00
63-65 deg. bulk	25.00	24.00
68-72 deg. bulk	26.00	25.00

Kerosene	Bulk	Barrels	Cases
Standard white 110	6.00	12.00	15.50
Water white 150	7.00	13.00	16.50

The Texas Company

Gasoline, cases		33.25	32.25
Kerosene	Bulk	Barrels	Cases
Standard White	6.00	12.00	15.50
Prime White	6.50	12.50	16.00
Water White	7.00	13.00	16.50

Output Of Soft Coal Goes Up 11 Per Cent

Staff Special

CLEVELAND, May 29.—The output of bituminous coal the first four days of last week was the largest of any like period since the soft coal miners struck April 1, indications being the production for the week would be close to 5,000,000 tons, compared with less than 4,500,000 tons for the preceding week which was the best since the walkout. Figures compiled by the United States Geological Survey, show car loadings for the first four days last week exceeded 14,600 a day and on Tuesday were 15,026, the greatest during the strike.

Full reports for the week ended May 20 show production to have been 4,472,000 tons of bituminous and 8,000 of anthracite, the latter being a slight increase over preceding weeks. The increase last week in soft coal output was about 11 per cent.

"The increase," says the survey, "is largely in response to higher prices and more active demand, calling into production mines which have hitherto been working only part time in the districts not affected by the strike. To a much smaller extent the increase results from resumption of work at mines at first closed by the strike in eastern Kentucky and southern West Virginia. Shipments are increasing slowly out of the Connellsville coke regions and the Kanawha and New River fields. From the strongly organized districts no resumption of work has been reported. The region to furnish the greater part of the increase is the middle Appalachian where the mines are rapidly approaching the maximum production. The accumulation of unbilled coal is declining. It is clear that consumers' stocks must be falling steadily but by how much is uncertain."

The average number of unbilled cars held at the mines in the week ended May 20 is given as 10,186 (preliminary), compared with 12,009 May 13 and 14,942 May 6. The reduction, the survey says, has been most rapid in the industrial districts north of the Ohio and Potomac rivers. In the northern Appalachian fields the number of no bills is said to be practically stationary but in the far West it is large. Much of the unbilled coal is said to be held for special consumers.

According to the *Coal Trade Journal*, bituminous coal quotations for the week ended May 20 are double those of the preceding week in West Virginia and Ohio and up about 50 per cent in the Connellsville district. Kentucky and Illinois quotations remain about the same after an increase in the second week of May.

WASHINGTON, May 29.—The output of Fuller's earth in the United States in 1921 was 105,609 tons valued at $1,973,848, according to the United States Geological Survey. The quantity decreased 18 per cent and the value 21 per cent as compared with 1920. The average value a ton in 1921 was $18.69. Imports during the year amounted to 9,744 tons, a decrease of 49 per cent.

Refiners' and Jobbers' Supplies

Following are the average market prices for the week on the principal materials used by refiners and jobbers, f. o. b. shipping point as effective this date.

Benzol

	May 29	May 22
Pure Water White	29-35	29-35
90 Per Cent	27-31	27-31
†Spot, 90 Per Cent	Nominal	Nominal

Refiners' Supplies

Soda Ash, light	$1.90-2.25 cwt.	$1.90-2.25 cwt.
Silicate of Soda 60 deg.	2.35 cwt.	2.35 cwt.
Sal. Soda	1.20-1.45 cwt.	1.20-1.45 cwt.
Caustic Soda 76%	3.85 cwt.	3.85 cwt.
Chloride of Lime	1.60-1.90 cwt.	1.60-1.90 cwt.
Sulphuric Acid 60 deg. tank cars f. o. b. sellers' shipping point	15.00—16.00—	15.00—16.00

Jobbers' Supplies (Open Market)

Vegetable Oils—		
Linseed Oil, carloads	87-90 gal.	87-90
Less do	-91	-93
5 Bbls or less	-94 "	96
Boiled, tank	-85 "	87
do carloads	-91 "	93
Soya Bean Oil Spot N. Y. bbls.	11¾-	Nominal
Animal Oils—		
English Degras	4-4¼c lb	4-4¼c lb
Domestic Degras, bbls. carloads	4c lb	4c lb
Horse Oil	6c lb	6c lb
Oleic acid—		
Dist	8½-8¾	8½c-8¾
Saponified	8¾	8¾c
Prime Edible Tallow under 1½ ffa. 4045 c. t.		
Prime Winter Strained Lard Oil 1 to 1½ffa. 40/45 c.t. 13		12½ lb
Extra Winter Strained Lard Oil 2 to 4½ffa. 40/45 c.t. 12¼	11¾	lb
Extra Lard Oil 4 to 5 ffa. 40/45 c.t. 11½	11	lb
Extra No. 1 Lard Oil 7 to 10 ffa. 40/50 c.t.	10¾	10½ lb
No. 1 Lard Oil 15 to 18 ffa. 40/45 c.t.	9⅝	9¼ lb
Special No. 1 Lard Oil 18 to 20 ffa. 40/45 c.t.	9¼	9 lb
No. 2 Lard Oil 22 to 23 ffa. 40/50 c.t.	9	8¾ lb
Prime Packer Tallow New York	8¼ lb.	8¼ lb.
Tallow Oil acid less	.75 gal.	.75 gal.
Neatsfoot Oil—		
20 degree F. cold test under 1% ffa. 1.55		
30 degree F. cold test under 1% ffa. 1.50		
40 degree F. cold 12-15% 1% ffa. .86		.83
Lard Stearine	14 lb.	14½ lb.
Oleo Stearine	9¾ lb.	9¼ lb.
Fish Oils—		
Menhaden Fish Oil— Light pressed	.54 gal.	.54 gal.
Brown	.52 gal.	.49 gal.
Yellow bleached	.59 gal.	.59 gal.
Whale Oil—		
Extra winter bleached	76c lb.	72c lb.
Herring Oil, tank cars coast		Nominal
Seal Oil		Nominal
Naval Stores—		
Turpentine, N. Y.	.99-1.00 gal.	.98 gal.
*Turpentine	.91½ gal	.86 gal
Rosin B. N. Y.	5.50 bbl.	5.25 bbls.
Rosin F. N. Y.	5.80 bbl.	5.50 bbls.
*Rosin B	4.27½ bbl.	4.20 bbl.
*Rosin F	4.60 bbl.	4.50 bbl.
Rosin Oil 1st run	.36 gal.	.36 gal.
Rosin Oil 2nd run	.39 gal.	.39 gal
Pine Tar—		
Kiln Burnt, bbls.	10.00 10.00	$10.00
Retort Tar, bbls.	9.00	9.00

†Savannah, Ga., market
*Nominal

Linseed Oil Reduced 3 Cents Per Gallon

By Special Correspondent

NEW YORK, May 29.—Featuring the market for refiners' and jobbers' supplies last week was the cut of 3 cents a gallon in linseed oil. Caustic soda, benzol and soda ash remained unchanged. Oils were quiet. Spirits of turpentine soared to $1 but could probably have been purchased at 98 cents towards the close.

Chemicals

Soda ash held up well and no important price changes were recorded. Demand was fairly steady at $1.80 per hundred pounds, in single bags, carlots while barrels, carlots held at $1.95 on spot and $2.25 in smaller quantities. The contract market is maintained at $1.20 for single bags and $1.40 for barrels, carlots, basis 48 per cent works. Dense ash on contract is held at $1.25 in single bags and $1.45 per hundred pounds in barrels carlots.

Caustic soda was firm under a steady export demand. Dealers are quoting small lots for domestic trade at $3.75 to $4 per hundred pounds, ex store. Solid was held at $2.50 for 60 per cent works. Bleaching powder was well held. Buyers are manifesting more active interest and in large drums, f. o. b. works, the price was $1.60 per hundred pounds. Foreign grades were quoted at $1.60 to $1.65 ex dock. Benzol remained firm but no changes of importance were reported. Prices were the same as the previous week. The larger buyers seem to be a little more keenly interested but producers still find difficulty in meeting the demand.

Oils and Naval Stores

Linseed oil declined 3 cents a gallon and at the close was available at 87 cents a gallon for raw oil in carlots with indications that business might have been done at 86 cents on a firm bid. The market in general was rather soft reflecting the trend in Argentine seed. Offerings of English and Dutch oils were more liberal. English oil, for nearby shipment, was at one time offered at around 80 cents a gallon.

The demand for animal oils has been rather disappointing and no really important changes have come to the surface in this quarter of the trade. Menhaden fish oil ruled quiet and a little softer. Persistent reports have been current that offerings of the new crude oil have been as low as 32 cents at the northern plants. However, it is said that the fish caught so far this year have been bony, containing little oil.

Spirits of turpentine, at one time was selling up around $1 per gallon. Buyers were more keenly interested but no really good sized sales came to the surface. Stocks, locally, have been small of late which also tended to strengthen the market. Advices from the southern primary points have been bullish of late. Rosins were fairly well maintained at advances of from 25 to 30 cents in New York, over the previous Saturday.

WASHINGTON, May 26.—Fuel oil is gradually replacing coal in the Chilean nitrate industry, Commercial Attache C. A. McQueen at Santiago reports to the Department of Commerce.

CRUDE OIL PRICES

EASTERN FIELDS

	1922 May 29	1921 High		1921 Low		1920 High		1920 Low	
Pennsylvania	$3.25	Jan. 1	$6.10	June 29	$2.25	Mar. 2	$6.10	Jan. 1	$5.02
Cabell	2.11	Jan. 1	4.46	June 29	1.11	Oct. 11	4.46	Jan. 1	3.40
Corning	1.90	Jan. 1	4.00	June 29	4.20	May 15	4.25	Jan. 1	3.50
Somerset	1.90	Jan. 1	4.50	June 29	1.00	Oct. 11	4.50	Jan. 1	3.25
Somerset Light	2.15	Jan. 1	4.25	June 29	.90	Sept. 23	4.25	Jan. 1	3.25
Ragland	1.00	Jan. 1	2.60	June 29	.60	Sept. 23	2.60	Jan. 1	1.75

CENTRAL STATES FIELDS

Wooster	$2.60	Jan. 1	$4.05	June 27	$1.80	Mar. 10	$4.05	Jan. 1	$3.45
Lima	2.48	Jan. 1	3.73	June 27	1.58	Mar. 10	3.73	Jan. 1	2.98
Indiana	2.28	Jan. 1	3.63	June 27	1.38	Mar. 10	3.63	Jan. 1	2.88
Princeton	2.27	Jan. 1	3.77	June 27	1.27	Mar. 10	3.77	Jan. 1	3.02
Lodi	2.60	Jan. 1	4.00	June 27	1.80	Dec.	4.00	July	4.00
Illinois	2.27	Jan. 1	3.77	June 27	1.27	Mar. 10	3.77	Jan. 1	3.02
Waterloo, Ill.	1.75	Jan. 1	1.75	June 27	.75				
Plymouth	1.65	Jan. 1	3.48	June 27	.65	Mar. 3	3.48	Jan. 1	2.78
Canadian Petrolia	2.88	Jan. 1	4.13	June 27	1.98	Mar. 10	4.13	Jan. 1	3.3[illegible]
Western Ky.	1.90	Dec. 1	2.40	June 27	.58				

MID-CONTINENT FIELDS

Oklahoma-Kansas	$2.00	Jan. 1	$3.50	June 15	$1.00	Mar. 1	$3.50	Jan. 1	$3.00
Hewitt	2.00	Jan. 1	3.50	June 15	1.00	Apr. 8	3.50	Jan. 1	2.00
Healdton	1.00	Jan. 1	2.75	June 21	.60	Mar. 1	2.75	Jan. 1	2.00

Gulf is paying $2.25 for Oklahoma-Kansas crude above 38°

NORTH TEXAS FIELDS

Burkburnett	$2.25	Jan. 1	$3.50	June 4	$1.00	Mar. 1	$3.50	Jan. 1	$2.75
Electra	2.25	Jan. 1	$3.50	June 4	1.00	Mar. 1	3.50	Jan. 1	2.75
Corsicana, light	1.30	Jan. 1	3.00	June 24	.85	Mar. 1	3.00	Jan. 1	2.75
Corsicana, heavy	.75	Jan. 1	1.75	June 1	.85	Mar. 1	1.75	Jan. 1	1.30
Ranger	2.25	Jan. 1	3.50	June 21	1.00	Mar. 1	3.50	Jan. 1	2.75
Strawn	2.25	Jan. 1	3.50	June 21	1.00	Mar. 1	.50	Jan. 1	2.75
Moran	2.25	Jan. 1	3.50	June 21	1.00	Mar. 1	3.50	Jan. 1	2.75
Mexia	1.50	Dec.	1.00	Oct.	10.60				

NORTH LOUISIANA FIELDS

Caddo above 38	$2.00	Jan. 1	$3.50	June 27	$1.25	Mar. 15	$3.50	Jan. 1	$2.75
Caddo 35 to 37.9	1.90	Jan. 1	3.40	June 27	1.15	Mar. 15	3.41	Jan. 1	2.65
Caddo 32 to 34.9	1.85	Jan. 1	3.35	June 27	1.10	Mar. 15	3.35	Jan. 1	2.65
Caddo, heavy	1.25	Jan. 1	2.50	June 18	.60	May 10	2.50	Jan. 1	1.25
DeSoto	2.00	Jan. 1	3.40	June 27	1.15	Mar. 15	3.40	Jan. 1	2.64
Homer 36 and above	2.00	Jan. 1	3.25	June 27	1.00	Mar. 15	3.25	Jan. 1	2.50
Bull Bayou	1.90	Jan. 1	3.15	June 27	.90	Mar. 15	3.15	Jan. 1	2.50
Crichton	1.75	Jan. 1	3.00	June 27	.75	Mar. 15	3.00	Jan. 1	2.25
Haynesville, 34° and Above	1.85	Nov. 8	1.85	Oct. 1	.85				
Haynesville, below 34°	1.75	Nov. 8	1.75	July1	.75				
El Dorado (Arkansas), 34 Be' and Above	2.00	Nov. 8	2.00	July1	.90				
ElDorado (Arkansas), below 34 Be'	1.75	Nov. 8	1.75	July 1	.80				

GULF COASTAL FIELDS

Spindletop	$1.25	Jan. 1	$2.50	June 13	$ .80	Apr. 15	$3.00	Jan. 1	$1.50
Goose Creek	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Sour Lake	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Humble	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Batson	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	2.75	Jan. 1	1.50
Hull		Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Feb 18	2 00
West Columbia	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Edgerly	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Vinton	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Jenningas	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Dayton	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Saratoga	1.25	Jan. 1	2.50	June 13	.80	Apr. 13	3.00	Jan. 1	1.50
Somerset (Texas)	1.25	Jan. 26	2.00	May 28	1.25				

WYOMING FIELDS

Elk Basin	$1.90	Jan. 1	$3.10	June 27	$1.00	Mar. 16	$2.10	Jan. 1	$2.35
Grass Creek	1.90	Jan. 1	3.10	June 27	1.00	Mar. 16	3.10	Jan. 1	2.35
Big Muddy	1.40	Jan. 1	2.75	June 27	.50	Mar. 16	2.75	Jan. 1	2.00
Salt Creek	1.40	Jan. 1	2.75	June 27	.50	Mar. 16	2.75	Jan. 1	2.00
Lance Creek	1.90	Jan. 1	3.05	June 27	.95	Mar. 16	3.05	Jan. 1	2.30
Rock Creek	1.50	Jan. 1	2.85	June 27	.60	Mar. 16	2.75	Jan. 1	2.00
Osage	1.90	Jan. 1	3.05	June 27	.95				
Cat Creek, Mont.	1.90	Nov. 16	1.90	Oct. 19	1.50				

CALIFORNIA

SAN JOAQUIN VALLEY AND WHITTIER-FULLERTON FIELDS

Degrees	Price	Degrees	Price	Degrees	Price
14-17.9	$1.10	23-23.9	$1.31	30-30.9	$1.95
18-18.9	1.11	24-24.9	1.38	31-31.9	2.05
19-19.9	1.13	25-25.9	1.46	32-32.9	2.15
20-20.9	1.16	26-26.9	1.55	33-33.9	2.25
21-21.9	1.20	27-27.9	1.65	34-34.9	2.35
22-22.9	1.25	28-28.9	1.75	36 and above	2.45
		29-29.9	1.85		

1921 Natural Gasoline Production Shows Gain

WASHINGTON, May 30.—The output of natural gasoline in the United States increased in 1921 20 per cent over that produced in 1920, according to a preliminary statement by E. G. Sievers of the Geological Survey. Returns so far are incomplete and revisions are expected.

The output, according to present figures was 473,658,500 gallons valued at $65,717,900, compared with 384,743,922 gallons valued at $71,788,122 in 1920. In producing this amount, 469,426,600,000 cubic feet of gas were used, making the average recovery slightly more than one gallon to 1000 cubic feet of gas. The average price received was 14 cents a gallon and ranged from 11 cents a gallon in Oklahoma to 20 cents in Kentucky.

About 75 per cent of the output was recovered at compression plants and the remainder at absorption plants. The daily average recovery was 1,297,000 gallons compared with 1,054,093 in 1920.

The decrease in the value is attributed to the break in the petroleum products market, the average price being 5 cents a gallon less than in 1920.

Gasoline produced by compression and vacuum in 1921 was:

State	Plants	Gallons	Value
Oklahoma	252	175,350,200	$19,779,100
Texas	55	81,062,000	10,584,000
California	44	37,078,300	7,010,700
West Virginia	159	17,827,600	2,999,700
Wyoming	6	14,495,100	1,590,400
Pennsylvania	276	11,684,800	1,720,700
Louisiana	15	7,158,700	724,000
Illinois	89	6,358,500	919,200
Ohio	43	2,188,800	318,000
Kansas	8	1,580,000	300,100
New York	4	366,200	54,000
Kentucky	6	196,700	38,300
Total, 1921	**957**	**355,346,900**	**$46,038,200**
Total, 1920	**967**	**281,131,973**	**$50,272,961**

Gasoline produced by absorption was:

State	Plants	Gallons	Value
West Virginia	45	35,730,000	$ 6,772,400
California	33	22,405,000	3,616,900
Oklahoma	52	20,610,700	2,730,200
Texas	13	8,687,600	1,084,400
Pennsylvania	29	8,304,800	1,582,500
Louisiana	13	8,261,600	1,106,200
Ohio	12	8,121,200	1,678,400
Kentucky	3	4,045,200	796,700
Kansas	3	2,083,000	302,800
Wyoming	1	62,500	9,200
Total, 1921	**204**	**118,311,600**	**$19,679,700**
Total, 1920	**187**	**103,611,949**	**$21,515,161**

BUFFALO, N. Y., May 26.—A. S. Matthews, president of the newly formed New York State Petroleum Marketers Association, is making a trip through the state calling on members of the organization and endeavoring to get operations going so that marketers may be able to help one another. Already jobbers in Jamestown, Rochester and one or two other cities are availing themselves of the facilities of the association and Mr. Matthews will try to extend the policy.

ALBERT LEA, MINN., May 26.—The W-K Supply Co. this week is opening two service stations here. Both are located on important highways. The stations will handle two grades of gasoline and lubricating oils.

Form 1201

CLASS OF SERVICE	SYMBOL
Day Message	
Day Letter	Blue
Night Message	Nite
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a day message. Otherwise its character is indicated by the symbol appearing after the check.

WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

CLASS OF SERVICE	SYMBOL
Day Message	
Day Letter	Blue
Night Message	Nite
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a day message. Otherwise its character is indicated by the symbol appearing after the check.

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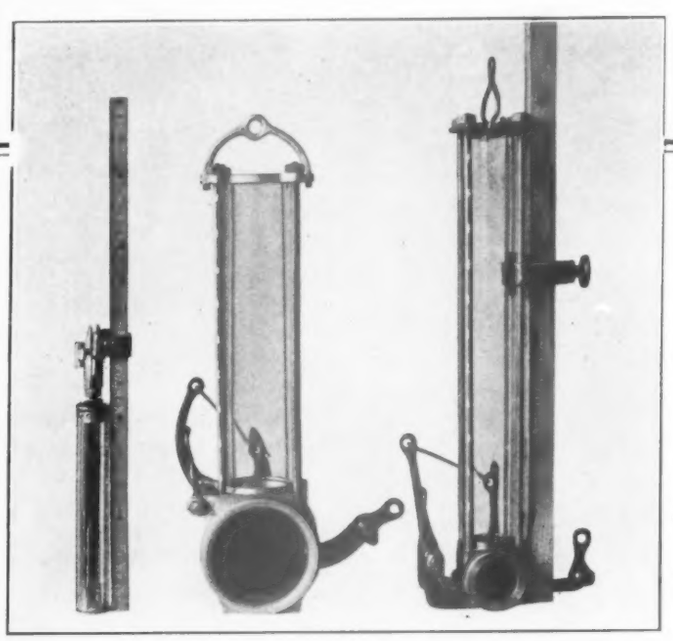
TAXMAN REFINING CO.

J M CARSON PRESIDENT



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OIL FINANCE

Standard Shares Advance Sharply

THE primary upward movement of the stock market which was temporarily halted two weeks ago, again became evident in the oil list last week and 12 new highs were recorded, chiefly among the Mexicans and large Independents. Remarkable gains were made by some of the Standard Oil shares on the New York Curb and by Gulf Oil, which, according to frequent reports on the street but later denied by one of the Mellon family, was to be merged with Standard of Indiana. These rumors shot up Gulf 75 to 80 points on the week and closing sales were at 570 a new high for the year. This figure is almost 200 points higher than the highest asking price "over the counter" last year.

Standard of Indiana Up 11 Points

Standard of Indiana on the curb rose to 118, for the $25 shares, 11 points higher than the close of the preceding week and 8¾ above the previous high of the year. Prairie Pipe and Vacuum Oil sold on the curb at 18 and 19 points higher than the previous week and the new shares of Standard of Kentucky rose to 94, 10 points higher than its record since the revamping of the capital stock in April.

The biggest gain on the stock exchange list was Phillips Petroleum which rose 5 points above its previous 1922 peak. Sinclair Consolidated was the most active on the oil list, sales totaling 284,700 for the week, carrying the stock to 37¼, a new level. Its close at 36⅛ was 1½ points above the close the week before. This continued strength in Sinclair is caused by the belief that cash dividends soon will be paid, its president having announced that payment is now possible and at the directors' discretion. Its affiliated company, the Mammoth Oil Corp., which has the Teapot Dome development contract has already started operations and this also has a bullish effect.

Marland Oil Growing Attractive

Traders are confident of the future of Marland Oil, especially its subsidiary the Marland Oil Co. of Mexico, which has extended the Panuco field of Mexico westward. The shares of the Mexican company are selling at 5½ on the New York Curb but on Dec. 31, last, were carried at $1 each on the books of the holding company which has 1,500,000 of them. This appreciation means almost $7,000,000 to the holding company whose shares on the Exchange rose to a new high at 34¾. Sales for the week totalled 25,600.

The Doheny stocks were strong but less activity was evident in the Mexican Petroleum, the speculative element of the street in the last two weeks centering its interest in steels and rails. Mexican Petroleum however, advanced to 137¾, a new high for the year, Pan-American Petroleum & Transport went to 68¼ and the class B common rose to 60⅞.

Independents Make New High Marks

Producers & Refiners continued the advance, reaching a new high level at 46⅜ for the common and 47¼ for the preferred. Considerable speculative interest was still attracted by Transcontinental and it touched a new high early in the week at 20⅛ but eased off to 18 at the close. Indian Refining exceeded its par by ¼ point. California Petroleum advanced to 61½, a new high and Cosden topped its former record by a fraction.

Skelly was the most active oil stock on the curb, sales totaling 86,500, resulted in the stock's rising to 9⅝, a fraction under its par, and the highest it has been in two years. Sapulpa Refining also made a new high at 4½ for the $5 shares. Carib Syndicate shares advanced a fraction above the previous high mark. Mexican Seaboard and International Petroleum still held considerable interest but failed to touch their recent high marks.

A gain of 2½ points was made by Lone Star Gas above its previous record on the Pittsburgh Exchange and Ohio Fuel Supply went 3½ above its previous high level.

Financial Notes

Ohio Oil Co.—Otto Donnell, vice president, also elected treasurer to fill the vacancy caused by death of George J. Marks. Other officers re-elected.

Phillips Petroleum Co.—Issue of 10-year 7½ per cent gold debenture bonds without stock warrants, part of $3,500,000 issue in hands of public, sold through Dominick & Dominick at 103 and interest to yield about 7.05 per cent.

Standard Oil Co., New York.—Peter M. Speer elected director to succeed the late Martin Carey. Howard A. Cole elected vice president to succeed Mr. Carey and C. M. Higgins elected secretary to succeed Mr. Cole.

Phillips Petroleum Co.—Earnings for April after taxes, expenses, and sinking fund but before depreciation, were $790,000. This is said to be the largest monthly earnings Phillips has ever had and equivalent to more than $14 a year on the 660,000 shares of outstanding capital.

Island Oil & Transport Corp.—Committees headed by Charles T. Brown urge depositing of voting trust certificates at the Lincoln Trust Co., 7 Wall street, New York, by June 7. The deposit agreement will provide that if the committee negotiates and files with the depositary a plan of reorganization any depositor not assenting to the plan may withdraw his deposited certificates.

Humphreys Oil Co. Reports Large Net

COLUMBUS, OHIO, May 26.—B. G. Dawes, president of The Pure Oil Co.; R. W. McIlvain, vice president, and F. S. Heath, secretary, have been elected directors of the Humphreys Oil Co., representing The Pure Oil Co.'s 25 per cent interest in that company.

A preliminary statement of earnings of the Humphreys Oil Co. shows net income after all charges, including depreciation and depletion, amounting to $5,300,000 from the beginning of that company's operations little more than six months ago, to April 30. The balance sheet reflects approximately $8,000,000 net current assets against a capitalization outstanding of $8,300,000.

Reports to directors of the Humphreys Oil Co. show that practically the entire drilling campaign in the Mexia field up to this time has been in the way of line, or off-set wells. The company is now in a position of such dominance in the Mexia field that it can at any time go on with drilling in a normal way on inside territory, which is at this time practically untouched, the reports say.

Cities Service Co. Oil Income Falls In 1921

NEW YORK, May 27.—Oil revenues of the Cities Service Co. were greatly reduced in 1921, according to the annual report to stockholders by President Henry L. Doherty, but the public utility subsidiaries made the largest earnings in their history.

At the inception of the lowered prices for crude oil, the company adopted a policy of curtailment, Mr. Doherty writes, and during the year completed but 60 wells compared with 313 in 1920.

"The production was not so large as the preceding year but its volume in comparison with the development work done, indicates the settled character of our producing wells," he says.

Cities Service marketing operations were extended and improvements were made in refineries. These changes placed the company in a better position at the beginning of 1922, than in 1921, Mr. Doherty reports.

The consolidated balance sheet of Cities Service Co. and subsidiaries shows the current assets Dec. 31, were about two and one-third times as great as the current liabilities. Surplus and reserves amounted to more than $71,000,000 as against $54,000,000 at the end of 1920.

The consolidated income accounts of 1921 and 1920 compare as follows:

	1921	1920
Gross earnings	$85,128,433	$118,259,500
Operating costs...	61,423,889	82,115,810
Net earnings ...	**$23,704,543**	**$36,143,690**
Interest charges ..	11,906,508	12,824,447
Net stock	**$11,798,035**	**$23,319,243**
Preferred dividends	5,191,724	5,260,202
Net to common	**$ 6,306,311**	**$18,059,041**

Capital stocks and funded debts of subsidiary companies follow:

	1921	1920
Common stocks—		
Owned directly	$158,139,929	$153,169,118
*Inter-company	62,572,465	64,170,765
Outstanding	5,060,385	5,140,596
Total	**$225,772,779**	**$222,480,479**
Preferred stocks—		
Owned directly	$26,913,307	$23,127,776
*Inter-company	2,141,000	641,000
Outstanding ...	12,424,918	10,395,899
Total	**$41,479,225**	**$34,164,675**
Bonds and funded notes—		
Owned directly	$ 9,749,493	$ 8,295,249
*Inter-company	6,938,400	26,387,000
In sinking fund	2,959,267	2,430,889
Outstanding....	123,137,584	118,037,399
Total	**$142,784,744**	**$155,150,537**

*The securities of operating companies which are owned by sub-holding companies, are referred to above as inter-company securities. Such sub-holding companies are: Toledo Traction, Light & Power Co., Empire Gas & Fuel Co. (Del.), and Dominion Gas Co.

The consolidated balance sheet as of Dec. 31, 1921, follows, comparison with previous years being impossible because other statements contained inter-company accounts:

Assets	
Plant	$342,899,355
Sinking fund	3,704,773
Employes' subscrip.	1,033,844
Cash	4,904,221
Securities	560,301
Bills receivable	1,405,674
Acc'ts receivable	16,175,633
Oils in stock	7,537,846
Material supplies	11,854,438
Prepayments	4,307,141
Discounts	6,892,332
Special deposits	340,249
Total	**$401,615,808**
Liabilities	
Preferred stocks	$ 78,239,932
Preference B Stock	3,446,970
Common stock	46,511,016
Subsidiaries—	
Preferred	12,424,918
Common	5,060,384
Bonds and funded notes—	
Series A	28,860
" B	5,994,150
" C	16,918,080
" D	6,871,000
Subsidiary bonds	123,137,584
Subsidiary securities	2,959,267
Bills payable	9,382,202
Accounts payable	5,459,499
Accrued taxes	1,410,773
Accrued interest	1,821,382
Other liabilities	458,491
Preferred cash scrip	2,832,259
Common cash scrip	1,622,298
Stock scrip	4,055,744
Customers deposits	1,374,081
Depreciation, etc.	24,593,908
Surplus	47,013,011
Total	**$401,615,808**

Crude Price Reduces Invincible Earnings

NEW YORK, May 27.—The Invincible Oil Corp. has a deficit of $307,355 from its operations in 1921 as compared with a profit of $6,187,525 in 1920, due to the great decline in the price of crude oil last year, according to the annual report of President E. R. Ratcliff to the stockholders. The operations of the corporation were greatly increased during the first quarter of 1922 and 1,171,169 barrels of oil were produced in that time. Net earnings exceeded $1,000,000 in the quarter, Mr. Ratcliff says. The only major construction work undertaken by the company last year was the extension of a 6-inch pipe line from the Homer field to Haynesville and El Dorado. This was 42.3 miles long.

The income accounts of 1921 and 1920 compare as follows:

	1921	1920
Operating profit ..	$ 1,130,026	$ 9,427,180
Other income	43,504	138,474
Total income ...	**$ 1,173,530**	**$ 9,565,654**
Interest, etc.	661,686	1,715,559
Development, drilling expenses, etc.	819,199	1,662,570
*Deficit	$ 307,355	†$ 6,187,525

*Before depreciation, depletion, etc.
†Net income.

The consolidated balance sheets as of Dec. 31, 1921 and 1920, compare:

ASSETS	1921	1920
Property	$40,788,450	$28,101,568
Trustees for S. F..	75,272	117,093
Organization expenses	212,000	70,000
Inventory	1,465,510	1,926,790
Investments	66,228	12,684,367
Notes receivable..	90,699	530,519
Accounts receivable	721,480	1,704,577
Liberty bonds, etc.....		36,963
Cash	782,072	955,547
Deferred assets .	1,615,488	190,121
Totnl	**$45,817,199**	**$46,317,545**
LIABILITIES		
Capital stock	$15,952,883	$18,817,400
Min. stock int. in subsidiaries	273,374	632,610
Accounts payable.	1,309,204	1,090,698
Notes payable ...	1,296,183	3,412,502
Gold bonds	2,799,000	.....
Esperson & Bonner note	1,920,000	3,900,000
Accrued expenses.	60,596	123,788
Accrued interest .	342,531	441,031
Accrued taxes ..	24,641	1,254
Tank car equip. cont.	736,922	966,684
Employes' stock subscription acct.	3,591	15,808
Reserves	8,133,629	3,633,712
*Min. int. in subsid. cap. stock.	1,071,686	1,652,214
*Surplus	11,892,949	11,629,844
Total	**$45,817,199**	**$46,317,545**

*Before depletion, depreciation, etc.

Shell Union Oil Offers 6% Preferred At 96

NEW YORK, May 29.—The Shell Union Oil Corp. has offered for subscription at 96 and accrued dividend, $20,000,000 of 6 per cent cumulative preferred stock, series A, to yield about 6.25 per cent. This represents the sole outstanding preferred stock and the 8,000,000 shares of common stock without par value are held at $181,912,822, which, the company states, represents the net assets less the preferred stock. Application to list this issue on the New York Exchange will be made, President William H. Allen says.

Mr. Allen further summarizes the Shell Union affairs:

"The Shell Union Oil constitutes a consolidation of substantially the entire Royal Dutch-Shell and Union Oil Co. of Delaware interests in the Mid-Continent and California fields. It is now one of the largest operations in the oil industry of the United States. Through its subsidiary companies, it owns and operates oil properties in the California and Mid-Continent fields, having a total production on this date in excess of 48,000 barrels, exclusive of 3,000 barrels settled production temporarily shut in pending development of further marketing facilities. Its total refining capacity is 48,000 barrels per day which is being substantially increased; it has 752 miles of pipe lines. It also has complete facilities of the Pacific coast for distribution of its products to the ultimate consumer.

The Shell Union Oil Corp. owns the entire outstanding capital stocks of the following corporations: Shell Co. of California, Roxana Petroleum Corp., Ozark Pipe Line Corp., Matador Petroleum Co. and an option to purchase two-thirds of the common stock of the Central Petroleum Co. the equity and earnings applicable to which two-thirds interest have been included in the following statements of earnings and financial condition:

"The Shell Union Oil Corp. also owns 26.17 per cent of the capital stock of the Union Oil Co. of California, which had an average production during 1921 in excess of 27,000 barrels per day; five refineries with total daily refining capacity of more than 62,000 barrels; and 740 miles of pipe lines; and extensive distribution system throughout the Pacific coast territory.

"Total combined net assets (after deducting all liabilities other than capital stock), conservatively valued at over $201,912,822, are equal to $1,010 per share of the preferred stock. Net current assets alone of $23,081,753, are equal to $115 per share.

"Net profits for the four years ended Dec. 31, 1921 after deducting federal taxes and $41,837,658 for depreciation, depletion and drilling charges, averaged $6,188,020 or more than five times the $1,200,000 annual dividend requirements of the preferred stock.

"Net profits for the year ended December 31, 1921, were $4,840,468, or more than 4 times this annual requirement."

The issue was issued through Lee Higginson & Co.

Over-Production Hits Pure Oil Co. Earnings

COLUMBUS, O., May 26.—Overproduction of crude and refined oils, the general business depression and writing down of inventories to the lower of cost or market resulted in a reduction of earnings of the Pure Oil Co. for the year ended March 31, 1922, compared with the preceding year, President B. G. Dawes says in a statement to stockholders.

"The present demand for refined oils for both domestic and foreign consumption has decidedly improved while the production of crude oil has declined," he continues, "and we have confidence that we are entering a more prosperous year.

"The recent issue of common stock to shareholders at par was successfully and fully consummated on April 10, last, but only $1,292,600 is reflected in the report which represents the amount subscribed and paid for prior to the closing of the fiscal year. From the proceeds of the sale provision has been made for the retirement on June 1 of all of the company's serial notes amounting to $7,980,000 maturing in 1922, 1923, 1924 and 1925, leaving the company with no funded debt except those of the gas distributing companies.

"During the year $7,000,000 was invested in the stock of the Humphreys Oil Co., $4,000,000 in the Humphreys-Pure Oil Pipe Line Co. and the Humphreys-Pure Oil Refineries Corp. and $4,339,852 in capital expenditures, principally in the producing, refining and distributing divisions and in the share of underlying and affiliated companies."

A loss of $1,276,056 was written off the inventory last year and after the payment of dividends, depreciation, depletion and all other charges, there followed a profit and loss deficit of $5,737,276 but the surplus at the end of the fiscal year remained about two thirds of the capitalization. Current assets were more than double the current liabilities. Quick assets included $4,434,000 cash and $7,168,000 marketable securities.

The income accounts for the years ended March 31, 1922 and 1921, follow:

	1922	1921
Gross Earnings	$60,722,417	$72,977,460
Operating costs	51,779,290	58,976,239
Net earnings	**$ 8,943,127**	**$14,001,221**
Federal taxes		1,652,905
Interest and discount	957,101	987,569
Depreciation	3,019,244	2,724,697
Net income	**$ 4,966,782**	**$ 8,636,050**
Premium on stock sale	126,816	
Total income	**$ 5,093,598**	
Pfd. dividends	1,291,180	735,622
Com. dividends	4,034,940	4,662,500
Com. div. stock	987,875	
Deficit	**$ 1,220,397**	***$ 3,237,928**
Surplus adj.	65,835	
Inventory loss	1,276,056	
Depletion allowed for purposes of federal taxes	3,174,988	
Total losses	**$ 5,737,276**	

*Surplus.

The consolidated balance sheets as of March 31, 1922 and 1921, compare as follows:

ASSETS	1922	1921
Property less depreciation	$ 98,876,552	$101,811,872
Treasury stock	316,000	997,900
Investments	16,519,015	11,007,474
Cash	4,434,281	2,679,800
Securities	7,168,136	394,724
Acc'ts. rec.	4,621,308	4,238,734
Notes, acceptances rec.	687,273	398,439
Refined oils	7,401,699	* 10,550,939
Crude oil	2,787,600	
Material, supplies	2,016,521	2,541,975
Deferred charges	1,149,170	1,208,185
Total	**$145,977,555**	**$135,830,042**

*Both refined and crude oils.

LIABILITIES		
Common stock	$ 52,882,625	$ 49,392,500
Preferred	20,000,000	14,869,800
Moore Oil preferred	800,000	800,000
Funded debt—		
Columbus Gas	1,301,000	
Dayton Gas	1,378,000	† 13,069,000
Springfield Gas	400,000	
Serial notes	7,980,000	
Acc'ts. payable	2,234,859	1,399,113
Notes payable	11,565,860	1,300,000
Accrued taxes	384,020	2,240,203
Accrued interest	259,689	266,395
Consumers' deposits	286,440	286,080
Ins. reserve	91,080	55,093
Surplus	46,414,482	52,151,758
Total	**$145,977,555**	**$135,830,042**

†Entire funded debt.

New York Bonds

	Week Ended May 26 High	Low	Last
Atlantic Ref. 6½s	103⅜	103½	103¾
Barnsdall A 8s	106	104	106
do B 8s	105½	105½	105½
Invincible 8s	98	96½	101¾
do 8s	100	97⅛	97⅛
do 7½s war	102½	101¾	102½
do 8s war	110½	108	110½
Mexican Pet. 8s	107¼	105⅞	107
Pan-American 7s	100½	100	100½
Pierce 8s	101¼	100	101
Prod. & Ref. 8s	103	102½	102⅞
do 8s war	111⅛	110⅛	110½
Sinclair 7s	99⅞	99	99⅜
do 7½s	105	104¾	104½
Sinclair G. O. P. 5½s	99½	99⅜	99½
Stand. of Cal. 7s	106	104½	104¾
Tide Water 6½s	103	102¾	102¾
Union Tank Car 7s	103½	102	102

Cosden Nets 17 Cents On Its Common Stock

TULSA, May 27.—Cosden & Co. in 1921 netted $423,654 or the equivalent of 17 cents a share on the common stock after preferred dividends, interest, depreciation, depletion and other charges. Earnings before charges were $8,232,265 compared with $14,192,883 in 1920. The annual report shows a deficit of $2,111,890 after preferred and common dividends. The report includes the assets and liabilities of the Atlantic Petroleum Co. of which Cosden owns about 90 per cent. The consolidated income account for 1921 follows:

Gross income	$36,500,605
Cost and expenses	28,268,340
Balance	**$ 8,232,265**
Interest, etc.	1,549,538
Depreciation, depletion, etc.	6,259,073
Net income	**$ 423,654**
Preferred dividends	251,858
Common dividends	2,283,686
Deficit	**$ 2,111,890**

The consolidated balance sheets as at Dec. 1921 and 1920, compare:

ASSETS	1921	1920
Refineries, pipe lines, etc.	$20,040,763	$19,586,768
Oil lands, leases, gasoline plants, etc.	42,966,489	33,001,285
Tank cars	3,666,305	3,595,340
Investments in affiliated cos.	852,568	1,821,098
Cash in sinking fund	108,249	75,267
Deferred charges.	201,932	307,105
Cash for royalties	180,770	
Items in suspense		344,601
Cash	1,897,503	2,510,945
Crude oil	499,262	1,333,209
Refined oil	2,200,141	2,007,381
Materials and supplies	2,023,010	3,176,384
Notes and accounts receivable	3,280,217	3,392,954
Liberty bonds, etc.	24,550	24,204
Total	**$77,941,758**	**$71,176,541**

LIABILITIES		
Preferred stock*	$ 3,595,090	$ 3,595,040
Common stock	†25,258,340	20,549,424
Sub. co. mining shares	1,093,589	122,133
Royalties in trust.	149,770	
Notes, acc'ts payable	3,539,917	3,133,617
Acceptances discounted		69,591
Accrued interest, etc.	518,623	1,179,575
Pref. dividends accrued	20,988	20,988
Dividends payable	608,421	505,773
Bonded indebtedness	6,150,500	7,773,000
Purchase money obligations	529,609	376,057
Suspense items	131,734	
Reserves	12,042,228	14,846,749
Surplus	24,302,949	19,004,594
Totnl	**$77,941,758**	**$71,176,541**

*Par value $5.

†Represented by 968,355 shares, no par value.

Pittsburgh Curb Market

1921 High	1921 Low	1922 High	1922 Low	Par Value		Week's Sales	Op'ng May. 20	Week's High	Week's Low	Close May 26	Net Ch'ge
8½	1	3⅛	2	5	Colombia Synd	300	2⅛	1⅞	1⅞	1⅞	− 1/16
		570			Duquesne Oil	6,905	2⅞	3⅛	2¾	3⅛	+ ¼
					Gulf Oil Corp	315	485	*570	496	570	+ 85
					Guffey-GilGasProd						
24	.05	.09	.06	5	Homer Union Pet.	100		.07	.07	.07	
					Kay County ctf.						
					Marland Ref. ctf.						
					Marland Of Mex.						
					Marshall Oil						
.45	16	.40	.20	1	Mex.-Wyo. Oil	6,000	.32	.35	.32	.35	+ .03
					Omar Oil & Gas	300	1¾	1⅞	1⅞	1⅞	− 1/16
.12	.01	.06	.03	1	States Oil	90	35	35	35	35	0
					Tropical Oil						
					Twin City Oil	5,000	.06	.07	.06	.06	0
					Skelly	300		87⅛	87⅛	87⅛	

* New High

Oil Dividends

	Amount	Payable	Stock of Record
Chesebrough Mfg. q.	$3.50	June 30	June 10
do pfd. q	$1.75	June 30	June 10
Cities Service m.	½*	July 1	June 15
do pfd. m.	½*	July 1	June 15
do pfd. B m.	½*	July 1	June 15
Illinois Pipe s. a.	$6	June 30	June 2
Imperial Oil q.	3	July 1	June 10
do pfd. q.	2	July 1	June 10
Middle States q.	3	July 1	June 10
National Transit q.	50c	June 15	May 31
Ranger Texas q.	3	July 1	June 10
South Penn q.	$1.50	June 30	June 12
The Texas q.	75c	June 30	June 2
Texas Chief q.	3	July 1	June 10

*In scrip.

Transactions In Oil Shares On New York Stock Exchange

1921 High	1921 Low	1922 High	1922 Low	Listed Capital	Par Value	Stocks	Div Rate	Last Paid	Transactions week ended May 26 Sales	First	High	Low	Last	Ch'ge
107¾	91	135½	99	$40,000,000	100	Associated Oil	1½Q	Apr. 25, 22	6 000	124	129	124	126⅞	+ 2⅞
1125	820	1140	900	5,000,000	100	Atlantic Ref	5 Q	Mar. 15, 22						
113½	103¾	117	114	20,000,000	100	do pfd	1¾Q	May 1, 22	400	114¾	115⅝	114¾	115⅝	+ 1⅛
27	21	56½	19¾	13,000,000	25	Barnsdall Corp. A	.62½	Apr. 30, 21	30,500	47⅝	50¾	46⅞	48¾	+ ⅛
35	14¾	39	19¼	3,712,900	25	do B	.62½	Apr. 30, 21	2,100	33½	34½	32	32⅝	− 1⅛
19¾	7¾	15⅝	10½	150,000	N. P.	Caddo Central			5,500	12½	13⅝	12½	13½	+ ⅜
50¾	25	61½	43¼	14,877,000	100	California Pet	1¼	Oct. 1, 13	34,700	56⅞	*61½	56⅛	60¾	+ 3⅛
88	68½	98½	83	10,739,000	100	do pfd	1¾	Apr. 1, 22	100	96¾	96¾	96¾	96¾	+ ⅛
44⅞	22½	45½	31⅝	759,482	N. P.	Cosden & Co	.62½Q	May 1, 22	58,100	44¾	45½	44	45	+ ⅛
59½	39⅞	67⅞	45¾	252,837	N. P.	Gen. Amer. Tank	1½SA	Jan 1, 22	3,000	63¾	63¾	60⅞	62	− 3⅛
		99	98¼	7,367,500	100	do pfd	1¾Q		500	98⅝	99	98½	98⅝	+ ⅛
78¾	39½	67	55⅛	19,827,000	100	Gen. Asphalt			64,300	63¼	65⅛	62	64	+ 1⅛
117½	77	103	90	7,416,100	100	do pfd	1½Q	Mar. 1, 22	500	96½	100	96¼	100	+ ⅝
91⅛	25	78	45	3,729,700	100	Gilliland pfd	2	May 15, 21						
86	40½	83¾	70	25,000,000	100	Houston			24,300	79½	82¾	77⅝	80⅞	+ 1⅛
7⅛	2	4⅞	3½	5,000,000	5	Indiahoma Ref	‡.15	Jul. 1, 21	5,800	4⅜	4¾	4¼	4¼	0
15¾	6½	10¼	5¾	7,830,450	10	Indian Ref	.50	Dec. 15, 20	13,000	8	*10⅛	8	10	+ ⅜
80	80			2,296,400	100	do pfd	1¾	Dec. 15, 21						
26	5½	20⅜	12⅞	22,689,900	50	Invincible			49,200	18½	19	17½	18⅛	+ ⅝
4¾	2	3	1⅝	22,600,000	10	Island Oil			8,900	1¼	1¼	1⅛	1⅛	0
9	4½	7⅛	4¾	14,669,850	10	Kansas & Gulf			8,100	5	5	4⅞	5	0
30⅞	12⅝	31¾	22⅝	969,946	N. P.	Maricana Oil			25,600	32⅜	*34¾	31	34	+ 1⅞
167¼	84½	137¾	106¾	40,657,300	100	Mexican Pet	3Q	Apr. 10, 22	74,700	136¼	*137¾	133⅛	136¼	+ 1¼
94	70	92	79¾	12,000,000	100	do pfd	2Q	Apr. 1, 22						
16⅛	10	16	11⅝	14,712,380	10	Middle States	.30Q	Apr. 1, 22	79,800	13	15½	14¾	14⅞	+ ⅛
4	1¾	3⅜	2¼	15,000,000	5	Okla. P. & R	2	Apr. 1, 21	12,300	2⅞	3⅛	2⅞	3⅛	+ ⅛
80⅜	27½	69¾	44⅜	3,500,000	N. P	Pac fic Oil	1½ SA	Jan 2., 22	64,100	64¾	65¾	63⅝	64⅝	− ⅛
79⅛	38½	68¼	47⅞	48,292,450	50	Pan Amer. F. & T	1½Q	Apr. 10, 22	40,200	66½	*68¼	64¾	67½	+ 1
71¾	34½	60⅞	44	20,099,400	50	do B	1½Q	Apr. 10, 22	10,200	59¾	*60⅞	58¼	60¾	+ 1½
13½	6	12	7⅛	198,770	N. P.	Panhandle P. & R			1,000	7⅛	7⅜	7⅛	7⅛	+ ⅛
78½	68	73	69	3,226,900	100	do pfd	2Q	Apr. 1, 22						
34¼	16	54⅞	29¼	000,000	N. P.	Phillips Pet	50Q	Mar. 31, 22	63,200	48¾	*54⅜	48¼	53½	+ 5
14¾	5¼	12¼	7	25,747,825	25	Pierce Oil			58,000	10¼	10¾	9¾	9⅞	− ⅛
78	30½	71	39	15,000,000	100	do pfd	2Q	May 1, 22	4,800	57	58	53½	54½	− 1½
34½	20⅜	46⅜	24⅛	18,182,400	50	Prod. & Ref			84,400	44½	*46⅜	42½	46	+ 2⅛
40	35	47¼	36	2,961,950	50	do pfd	87½Q	Feb. 6, 22	400	47¼	*47½	44	44	+ 1½
40⅜	21⅛	38⅝	29¾	50,381,625	25	Pure Oil	.50Q	Jan 2, 22	24,700	33¼	33¾	32	32⅛	− ⅞
		102⅝	99	1,683,400	10	do 8% pfd	2Q	Apr. 1, 22	100	101	101	100½	100½	− 1
69⅞	40½	66⅜	47¼	(sh) 621,785	13.40	Roy. Dutch, N. Y	1.65	Feb. 15, 21	31,200	63⅞	64	63⅝	63⅝	− ⅞
49	30⅞	48¼	35⅝	(sh) 283,543	£1	Shell Transport	.83⅓	Jan. 21, 22	900	46	46	45	44	− 2
28⅜	16⅛	37¼	18¾	4,042,840	N. P.	Sinclair Cons	‖2Q	May 31, 22	284,700	34⅞	*37¼	34⅝	36⅛	+ 1½
98½	67¾	121	91	100,507,800	25	S. O. California	1.00Q	Mar. 15, 22	28,300	113⅝	117⅞	113¼	115⅞	+ 2¼
192⅝	124½	196	169¼	98,338,306	25	S. O. New Jersey	1.25Q	Mar. 15, 22	11,700	187¼	192½	187¼	189¾	− 1½
114½	104¼	116½	113⅜	116,676,600	100	do pfd	1¾Q	Mar. 15, 22	7,300	115½	116	114	114¼	− 1¼
13¼	3¼	8½	5	451,705	N. P.	Sunray Oil	50	Dec. 20, 20	8,50	7½	7½	7	7½	− ⅛
48	29	56½	42¼	163,298,100	25	The Texas Co	.75Q	Mar. 31, 22	76,900	48¼	50	48⅛	49⅛	+ ⅞
36⅞	19¼	31⅞	23	8,362,250	10	Tex. Pac. C. & O	.25Q	Mar. 31, 22	25,600	30¾	30¾	27⅞	29⅝	− ¾
175	119	137¼	109¾	49,347,500	100	Tide Water	2Q	Dec. 30, 21	300	131	132	130	130	− 3
13	6	20⅜	7½	2,000,000	N. P.	Transcont. Oil			188,000	17	*20⅛	16⅝	19⅛	+ 2⅛
25½	15⅛	24	17¼	1,367,229	N. P.	Union Oil			37,700	22⅜	25⅞	21⅜	25½	+ 2¼
107	87½	104½	96	12,000,000	100	Union Tank Car	1¾Q	June 1, 22						
100	92	107⅜	102	12,000,000	100	do pfd	1¼Q	June 1, 22	500	106¼	206¼	106	106	
		27	25	294,042	N. P.	White Eagle	.50Q		5,800	26	106⅝	25¾	26½	+ ⅛
17⅜	7	11¾	7½	699,046	N. P.	White Oil			10,800	10⅛	10⅛	9¾	9⅞	− ⅛

* New High † New Low ‡In Scrip ‖ In Stock

New York Curb Market

1921 High	1921 Low	1922 High	1922 Low	Par Value		Week's Sales	Op'ng May 20	Week's High	Week's Low	Close May 26	Net Ch'ge
10¾	3½	8½	3¼	25	Carib Synd	70,000		*8¾	7	8¼	+1
31½	11¼	24⅞	17	N.P.	Cities Ser. Bkrs	4,200	23⅝	23⅝	23⅛	23½	0
2¼	1⅜	2¼	1	5	Federal Oil	29,300		1⅛	1⅛	1⅛	− 1/16
2⅜	1	1⅝	.83	10	Glenrock Oil	64,000		1⅜	1⅛	1⅛	+ 1/16
24	1	9⅝	4	N.P.	Gilliland	2,800		6⅝	6⅛	6¼	− ⅜
17¾	9⅛	23⅞	14¼	5	Inter. Pet	40,700	22⅝	22⅞	21⅜	22¼	− ⅛
18½	15¾	26½	10¼		Kirby Pet	6,100		10¾	†10	10	− ½
15⅝	6¾	14⅞	8⅛	10	Merritt Oil	2,400	13¾	13¾	12½	12⅞	− ⅝
86	33	49⅝	28½	N.P.	Mex. Seaboard	47,600		47¼	44⅝	46	+ ⅜
		17⅛	9⅞	10	Mountain Prod	10,300	16⅜	16½	16	16½	+ ¼
3¼	1	2¼	1⅛	5	N. Amer. Oil	900		2	1½		
7	3	8	4⅞	10	Pennok. Oil	500		5½	5⅜	5¼	− ⅛
6⅝	2⅝	7½	4⅜	10	Prodrs. & Refrs	100		*8½	8½		
5⅛	2¾	4⅜	2⅞	5	Sapulpa	5,600		*4½	4⅜	4¼	0
15⅜	9¼	19⅜	12½	10	Salt Creek Prod	5,000	18¼	18⅝	18	18¼	+ ⅛
13⅜	5¼	12⅞	9¼	N.P.	Simms Pet	12,600	10¾	11	10	10⅜	− ⅛
9½	2½	8¾	4¾	10	Skelly	86,500	4¼	*9⅝	8⅛	9½	+1⅜

Pittsburgh Stock Exchange

1921 High	1921 Low	1922 High	1922 Low	Par Value		Week's Sales	Op'ng May 20	Week's High	Week's Low	Close May 26	Net Ch'ge
19	6½	12⅝	7	10	Arkansas Nat. Gas	12,810	11¾	12⅜	11⅜	11¾	0
35	18½	55½	20	25	Barnsdall Corp. A	400		50¼	50	50¼	+6¼
35	17¾	38½	20	25	Barnsdall Corp. B						
66	60	88¾	64½	100	Columbia Gas	25	86	87½	87½	87½	+1½
26	16¾	29	20	25	Lone Star Gas	4,323	26⅜	*29	26⅜	28	+1⅝
53	42	54	45⅝	50	Man. Light & Heat	911	53	53½	51½	52	−2
				N.P.	Marland Oil						
16⅛	10⅞	15½	13⅛	10	Middle States						
30¾	17½	26¾	19	25	Okla. Nat. Gas	2,230	22¼	22½	21¾	22	− ¼
24	11½	19⅞	16	1	Ohio Fuel Oil	615	19	19½	18¾	19	0
50	40	55	44½	25	Ohio Fuel Supply	1,405	51½	*55	51½	52¾	+1¼
3½	1⅞	2⅞	2½	5	Okla. Prod. & Ref	124		*2⅞	2¾	2¾	
16	11	15⅜	8⅝	5	PittsburghOilGas	2,000	9	9⅞	9	9⅝	+ ⅛
					Pure Oil	100	16½	17	17	17	+ ½
		14½	8¼	10	Salt Creek Con	5,875	13⅜	14¼	13½	14⅛	+ ¾
					Sinclair Oil	100		36¼	36¼	36¼	
27	25	29⅞	6¾	N.P.	Tidal Osage Oil	285	14	14¾	13¾	13¾	− ¼
					Transcont. Oil	100	16½	17	17	17	+ ½
120	107½	128¼	119	100	Union Nat. Gas	510	128¼	128½	128	128½	+ ¼

* New High †New Low

Standard Oil Stocks

	May 26 1922 Bid	Asked	1921 High	Low
Anglo-American	21	21½	22	14¼
Atlantic Refg	1060	1090	1225	820
Buckeye Pipe	96	98	88	70
Continental Oil	143	147	128	100
Cumberland Pipe	135	145	140	115
Galena Signal	53	56	53	29
Illinois Pipe	182	186	195	140
Indiana Pipe	94	97	86	69
Ohio Oil	313	317	300	222
N. Y. Transit	175	178	152	148
Penn-Mex	35	38	29	17½
Prairie Oil & Gas	615	625	598	385
Prairie Pipe	227	230	242	155
South Penn	213	218	266	150
S. O. Indiana	114¾	115	93¾	60¾
S. O. Kansas	560	570	635	520
S.O. Kentucky new	94	94½	*445	*370
S. O. New York	408	412	393	297
S. O. Nebraska	185	195	190	157
S. O. Ohio	460	470	429	329
Union Tank Car	98	102	116	80
Vacuum Oil	425	439	555	235

* Old Stock

Unlisted Stocks

By Carl H. Pforzheimer & Co.

	Par Value	Bid	Asked	High	Low
Gulf Oil Corp	$100	560	570	592	560
Humble Oil & Refg	100	238	243	261	150
Magnolia Petroleum	100	167	170	165	110

Miscellaneous Stocks

	Par Value	Bid	Asked	High	Low
Cities Serv. (a)	$100	232	234	256	101
do pfd (a)	100	65	65½	71	55
Ntl. Refg. (a)	25	48	50	45	26½
do pfd. (a)	25			118½	107
Par. Refg. (a)	25	14¾	15	25½	9½
do pfd. (a)	100	90	95	96	95
Indiahoma Refg. do(b)	5	4½	4⅝	7⅛	2
Marland Refg. (b)	5	8⅛	8½	80⅞	12⅛

(a) Cleveland (b) St. Louis